Risk review and Capital review

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The following parts of the Risk review and Capital review form part of the financial statements and are reviewed by external auditors:

→ From the start of the 'Credit Risk Review' section (page 141) to the end of 'Other principal risks' in the same section (page 212), excluding:

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→ From the start of 'CRD IV capital base' (page 219) to the end of 'Impact of IFRS 9 on CET1' excluding capital ratios and risk-weighted assets (RWA) (page 220)

Disclosures noted as 'Unaudited' are not within the scope of KPMG LLP's review.

Risk update

All risk types, both financial and non-financial, are managed and reported in accordance with the Group's Enterprise Risk Management Framework. 2018 saw sustained progress towards improving the resilience of the Group's portfolios as shown here by the key highlights from the past year.

2018 Key highlights

- Lower credit impairment in the ongoing book – 38 per cent reduction on levels seen in 2017
- Improved credit quality of the Corporate portfolios
- Further strengthening of our capital position

Our portfolio quality

Our core objective is to build a strong and sustainable business and in 2018 we made progress towards this end. We have secured the foundations of the Group, having overseen a continued reduction in credit impairment, and show resilience as evidenced by strong capital and liquidity metrics. Our Risk Appetite Statement is approved by the Board and is set to enable us to grow sustainably while avoiding shocks to earnings or our general financial health, and to manage our Reputational Risk in a way that would not materially undermine the confidence of our investors and all internal and external stakeholders. In 2018, we added further granularity to our Risk Appetite, including cascading critical Risk Appetite metrics down to countries with significant business operations. The Group will not compromise adherence to its Risk Appetite to pursue revenue growth or higher returns.

Credit quality has continued to improve in 2018, as the positive momentum from the previous year was carried over in many important areas. We further reduced our liquidation portfolio by 39 per cent to $1.4 billion at the end of 2018 (2017: $2.2 billion) through active management, with net loans and advances of $0.3 billion (2017: $0.7 billion), after provisions. From 2019, the Group will report the liquidation portfolio as part of its underlying business. Credit grade 12 balances were flat year-on-year, while we observed a decrease in net exposure on early alert from $8.7 billion to $4.8 billion, mainly due to reductions in counterparty exposure and accounts being regularised. The percentage of investment grade clients in our corporate net exposure increased to 62 per cent (2017: 57 per cent), and new origination is carried out within Risk Appetite. We remain alert to broader geopolitical uncertainties that have affected sentiment in some of our markets, and we continue to focus on early identification of emerging risks across all our portfolios to proactively manage any areas of potential weakness.

The Group continues to be well diversified, across industry sectors, products and geographies, and exposures remain predominantly short tenor. The Group remains selective in cyclical sectors such

Key indicators

	31.12.18 (IFRS 9)	01.01.18 (IFRS 9)	31.12.17 (IAS 39)	31.12.16 (IAS 39)
Group total business[1]				
Stage 3 loans, credit-impaired (2018)[2]/non-performing loans (2017) ($ billion)	**6.9**	8.8	8.7	9.7
Stage 3 cover ratio	**59%**	60%	60%[3]	60%[3]
Stage 3 cover ratio (including collateral)	**81%**	81%	81%	76%
Group ongoing business[1]				
Stage 1 loans ($ billion)	**237.1**	228.5		
Stage 2 loans ($ billion)	**17.4**	20.6		
Stage 3 loans, credit-impaired (2018)[2]/non-performing loans (2017) ($ billion)	**5.6**	6.5	6.5	5.9
Stage 3 cover ratio	**55%**	56%	56%[4]	57%[4]
Stage 3 cover ratio (including collateral)	**78%**	78%	79%	74%
Corporate & Institutional Banking and Commercial Banking[5]				
Investment grade corporate net exposures as a percentage of total corporate net exposures	**62%**		57%	56%
Loans and advances maturing in one year or less as a percentage of total loans and advances to customers	**60%**[6]		70%	70%
Early alert portfolio net exposures ($ billion)	**4.8**		8.7	12.9
Credit grade 12 net exposures ($ billion)	**1.5**		1.5	1.5
Aggregate top 20 corporate net exposures as a percentage of Tier 1 capital	**54%**		50%	55%
Collateralisation of sub-investment grade net exposures maturing in more than one year	**51%**		55%	55%
Retail Banking[5]				
Loan-to-value ratio of retail mortgages	**45%**		47%	49%

1 These numbers represent total loans and advances to customers
2 Following adoption of IFRS 9, the definitions of stage 3 and non-performing loans have been aligned. See Note 41 to the financial statements
3 2017 and 2016 total business cover ratios rebased to exclude portfolio impairment provisions to align to IFRS 9 (IAS 39: 65 per cent on 31 December 2017; 67 per cent on 31 December 2016)
4 2017 and 2016 ongoing business cover ratios rebased to exclude portfolio impairment provisions to align to IFRS 9 (IAS 39: 63 per cent on 31 December 2017; 69 per cent on 31 December 2016)
5 These metrics are not impacted by the adoption of IFRS 9, hence data as at 1 January 2018 is not needed for comparative purposes
6 Excludes fair value through profit or loss (including fair value through profit or loss: 71 per cent)

as commodity traders, oil and gas support, and metals and mining. There was an increase in the net exposure to our top 20 corporate clients as a percentage of Tier 1 Capital (2018: 54 per cent; 2017: 50 per cent), mainly in investment grade global majors. The largest sector concentrations within the Corporate & Institutional Banking and Commercial Banking portfolios are manufacturing, at 17 per cent of loans and advances to customers (2017: 16 per cent) and financing, insurance and non-banking financial counterparties, which remains at 15 per cent. All other industry concentrations are at or below 12 per cent. The proportion of long-term sub-investment grade exposure for which we are collateralised remains above 50 per cent. This has us well positioned to realise new opportunities, while remaining vigilant for any new threats that may arise and working on areas that need improvement.

In Retail Banking and Private Banking, loans and advances were broadly stable, with exposures mainly in Greater China & North Asia and ASEAN & South Asia. Secured lending remains the primary focus of our Retail Banking business, with 84 per cent of the book continuing to be fully secured as of the end of 2018. The average loan-to-value of the mortgage portfolio is low at 45 per cent (2017: 47 per cent). Retail Banking overall delinquencies remained stable with early delinquent buckets in stage 2 reducing to $381 million from $405 million last year.

The Group maintains a strong liquidity position, with the liquidity coverage ratio higher at 154 per cent from 146 per cent in 2017. This was driven by an increase in our liquid asset position partially aligned to the growth in our overall balance sheet as we continued to focus on high-quality liquidity across our businesses. The advances-to-deposits ratio (2018: 64.9 per cent) decreased from the previous year (2017: 67.0 per cent). We remain a net provider of liquidity to the interbank markets and our customer deposit base is diversified by type and maturity. We have a substantial portfolio of marketable securities which can be realised in the event of a liquidity stress situation. The Group's Common Equity Tier 1 ratio of 14.2 per cent was 60 basis points higher than 2017 mainly due to a lower level of risk-weighted assets which reduced by $21.5 billion. This was driven by a reduction in credit risk-weighted assets of $15.1 billion.

The average level of total trading and non-trading value at risk (VaR) in 2018 was $20.6 million, 20 per cent lower than in 2017, driven by a reduction in the duration of the non-trading portfolio in the first half of 2018. However, by year end 2018, the non-trading VaR had risen because of an increase in the portfolio inventory and reduced portfolio diversification in the second half of the year.

Stage 3/Non-performing loans

Overall gross credit-impaired (stage 3) loans for the Group reduced by 21 per cent in 2018, from $8.8 billion to $6.9 billion, as planned reductions in the liquidation portfolio were combined with decreases in the ongoing business.

Gross credit-impaired (stage 3) loans for the ongoing business decreased from $6.5 billion to $5.6 billion in 2018, mainly driven by repayments and write-offs in Corporate & Institutional Banking. There was also a large reduction in inflows to stage 3 in Corporate & Institutional Banking as historically high inflows in India and the oil and gas sector did not recur, offset by an increase in inflows to stage 3 in Commercial Banking exposures in Greater China & North Asia and Africa & Middle East, with no specific industry concentration. Most of these new stage 3 counterparties had been on early alert prior to transfer to stage 3 and do not indicate new areas of stress for the overall portfolio.

Gross credit-impaired (stage 3) loans for the Retail Banking portfolio remained broadly stable at $0.8 billion.

The cover ratio in the total book declined marginally to 59 per cent in 2018 (1 January 2018: 60 per cent), driven by the impact of write-offs and settlements in the liquidation portfolio, while the cover ratio including collateral was stable at 81 per cent. The cover ratio before collateral for Corporate & Institutional Banking decreased to 57 per cent (1 January 2018: 59 per cent) due to a small number of write-offs which had a high level of provisions; while the cover ratio after collateral decreased to 77 per cent (1 January 2018: 78 per cent). The cover ratio before collateral for Commercial Banking is stable at 70 per cent, although the cover ratio including collateral increased to 87 per cent (1 January 2018: 84 per cent). The cover ratio for Retail Banking remained stable at 48 per cent, and the cover ratio including collateral improved to 87 per cent (1 January 2018: 74 per cent).

Credit impairment

At a Group level, total credit impairment including the liquidation and restructuring portfolio is $0.7 billion, representing a loan loss rate of 21 basis points (bps) of average customer loans and advances. This was significantly lower than the levels observed in 2017 ($1.4 billion) and 2016 ($2.8 billion). Credit impairment for the ongoing business reduced by 38 per cent to $0.7 billion (2017: $1.2 billion), representing a loan loss rate of 24 basis points of average customer loans and advances, driven by improvements in Corporate & Institutional Banking and Retail Banking.

Credit impairment for the Corporate & Institutional Banking ongoing business is significantly lower at 35 per cent of the levels seen last year (2018: $229 million; 2017: $657 million). This reflected an improvement in the risk profile in this segment, and continued focus on high-quality new origination.

Commercial Banking ongoing business credit impairment increased by 45 per cent (2018: $244 million, 2017: $168 million) compared to 2017, which saw a release of $63 million of portfolio impairment provisions held against certain sectors of the portfolios that were no longer required. Africa & Middle East contributed 60 per cent of the full-year 2018 charge.

Retail Banking credit impairment was 29 per cent lower in the year (2018: $267 million, 2017: $374 million) driven by portfolio improvements, run down of high-risk segments in our unsecured portfolios and one-off provision releases in Korea and Indonesia.

Credit impairment in the restructuring portfolio was $(87) million (2017: $162 million), and includes the net release of $79 million in the liquidation portfolio due to loan disposals and repayments.

Credit impairment

	31.12.18 $million (IFRS 9)[1]	31.12.17 $million (IAS 39)[2]	31.12.16 $million (IAS 39)[2]
Corporate & Institutional Banking	**229[3]**	657	1,401
Commercial Banking	**244**	168	491
Private Banking	**–**	1	1
Retail Banking	**267**	374	489
Total ongoing business	**740**	1,200	2,382
Restructuring charge/(credit) (including liquidation portfolio)	**(87)**	162	409

1 Credit impairment under IFRS 9 covers a broader asset base than loan impairment under IAS 39, effective from 1 January 2018

2 2017 data is prepared and disclosed on an IAS 39 basis

3 Credit impairment recovery of $13 million in Central & other items is included in Corporate & Institutional Banking

Risk profile

Our risk profile in 2018

Through our well-established risk governance structure and Enterprise Risk Management Framework (ERMF), we closely manage our risks with the objective of maximising risk-adjusted returns while remaining in compliance with the Risk Appetite Statement. We manage uncertainties through a dynamic risk scanning process that provides a forward-looking view of the economic, business and credit conditions across the Group's key markets, enabling us to proactively manage our portfolio.

We continue to reposition the Group's corporate portfolio, exiting weaker credit or lower-returning clients and adding new clients selectively. We remain alert to broader geopolitical uncertainties that have affected sentiment in some of our markets, and we continue to focus on early identification of emerging risks across all our portfolios to manage any areas of potential weakness on a proactive basis. The Group's portfolio is well diversified across dimensions such as industries, geographies and products.

The table below highlights the Group's overall risk profile associated with our business strategy.

Our risk profile in 2018

Stronger risk culture across the Three Lines of Defence from increased awareness of the ERMF

- In 2018, we developed consistent and integrated Risk Type Frameworks for our ten Principal Risk Types
- We formalised links between our Strategy, Risk Appetite and risk identification to integrate risk considerations into strategic decision-making
- We enhanced our Risk Appetite coverage on non-financial Principal Risk Types
- We established clear individual accountability for risk management across the three lines of defence
- We aligned our risk committees to the ERMF
- We augmented our risk scanning processes to enable more dynamic and forward-looking assessments of risk
- We rolled out an ERMF Effectiveness Review process to measure progress in an objective manner

Further details on the Enterprise Risk Management Framework can be found in the Risk management approach (page 193)

Corporate portfolios remain well diversified and exhibit improving credit quality

- Credit impairment for the total ongoing business reduced by 38 per cent on 2017
- We further reduced our liquidation portfolio by 39 per cent in the year through active management
- Within the Corporate & Institutional Banking and Commercial Banking portfolios:
  - Exposure to investment grade clients has increased to 62 per cent of the total corporate book in 2018 (2017: 57 per cent)
  - The largest sector concentration are manufacturing at 17 per cent of loans and advances to customers, and financing, insurance and non-banking financial counterparties at 15 per cent. All other industry concentrations are at 12 per cent or lower of the total customer portfolio
- Over 50 per cent of long-term sub-investment grade exposures within the corporate portfolio remain collateralised
- Within the Retail Banking portfolio, secured lending remains our primary focus, with 84 per cent of the book continuing to be fully secured. Our overall loan-to-value ratio is low at 45 per cent

Robust capital and liquidity position

- We remain well capitalised and our balance sheet remains highly liquid
- We have a strong advances-to-deposits ratio
- We remain a net provider of liquidity to interbank markets and our customer deposit base is diversified by type and maturity
- We have a substantial portfolio of marketable securities which can be realised in the event of a liquidity stress situation

Credit Risk

Basis of preparation

Unless otherwise stated, the balance sheet and income statement information presented within this section is based on the Group's management view. This is principally the location from which a client relationship is managed, which may differ from where it is financially booked and may be shared between businesses and/or regions. This view reflects how the client segments and regions are managed internally.

Loans and advances to customers comprise the ongoing portfolio and liquidation portfolio in this section unless otherwise separately identified.

Loans and advances to customers and banks held at amortised cost in this Risk profile section include reverse repurchase agreement balances held at amortised cost, per Note 16 Reverse repurchase and repurchase agreements including other similar secured lending and borrowing.

Credit risk overview

Credit risk is the potential for loss due to the failure of a counterparty to meet its obligations to pay the Group. Credit exposures arise from both the banking and trading books.

IFRS 9 changes and methodology

IFRS 9 came into effect on 1 January 2018. As a summary the primary changes for the Group are as follows:

New impairment model

IFRS 9 introduces a new impairment model that requires the recognition of expected credit losses (ECL) rather than incurred losses under IAS 39 on all financial debt instruments held at amortised cost, fair value through other comprehensive income (FVOCI), undrawn loan commitments and financial guarantees.

Staging of financial instruments

Financial instruments that are not already credit-impaired are originated into stage 1 and a 12-month expected credit loss provision is recognised.

Instruments will remain in stage 1 until they are repaid, unless they experience significant credit deterioration (stage 2) or they become credit-impaired (stage 3).

Instruments will transfer to stage 2 and a lifetime expected credit loss provision recognised when there has been a significant change in the credit risk compared with what was expected at origination.

The framework used to determine a significant increase in credit risk is set out below (page 142).

Instruments are classified as stage 3 when they become credit-impaired.

Stage 1
- 12-month expected credit loss
- Performing

Stage 2
- Lifetime expected credit loss
- Performing but has exhibited significant increase in credit risk (SICR)

Stage 3
- Credit-impaired
- Non-performing

The Group has not restated comparative information. Accordingly, amounts prior to 1 January 2018 are prepared and disclosed on an IAS 39 basis. This primarily impacts the credit risk disclosures, where loan loss provisioning is determined on an expected credit loss basis under IFRS 9 compared with an incurred credit loss basis under IAS 39.

Where relevant, the 1 January 2018 balance sheet has been used for comparative purposes. The Group's initial estimate of credit impairment on adoption of IFRS 9 was $6,720 million. Following refinement of the Group's expected loss models, the estimate of the opening credit impairment was revised down by $222 million to $6,498 million, and the net expected credit loss of $(1,296) million adjusted against retained earnings was similarly decreased by $222 million to $(1,074) million. This was presented as part of the Group's 2018 interim financial statements.

A summary of the differences between IFRS 9 and IAS 39 is disclosed in Note 41 IFRS 9 Financial instruments.

IFRS 9 changes and methodology

The accounting policies under IFRS 9 are set out in Note 8 Credit impairment and Note 13 Financial instruments. The impact upon adoption of IFRS 9 as at 1 January 2018 is set out in Note 41 IFRS 9 Financial instruments. The main methodology principles and approach adopted by the Group are set out in the following table with cross references to other sections.

Title	Description	Supplementary information	Page
Approach to determining expected credit losses	For material loan portfolios, the Group has adopted a statistical modelling approach for determining expected credit losses that makes extensive use of credit modelling. Where available, the Group has leveraged existing advanced Internal Ratings Based (IRB) regulatory models that have been used to determine regulatory expected loss. For portfolios that follow a standardised regulatory approach, the Group has developed new models where these are material.	Credit risk methodology	174
		Key differences between regulatory IFRS expected credit loss models	175
		Determining lifetime expected credit loss for revolving products	175
Incorporation of forward-looking information	The determination of expected credit loss includes various assumptions and judgements in respect of forward-looking macroeconomic information.	Incorporation of forward-looking information and impact of non-linearity	175
		Forecast of key macroeconomic variables underlying the expected credit loss calculation	175

Title	Description	Supplementary information	Page
Significant increase in credit risk (SICR)	Expected credit loss for financial assets will transfer from a 12-month basis to a lifetime basis when there is a significant increase in credit risk (SICR) relative to that which was expected at the time of origination, or when the asset becomes credit-impaired. On transfer to a lifetime basis, the expected credit loss for those assets will reflect the impact of a default event expected to occur over the remaining lifetime of the instrument rather than just over the 12 months from the reporting date. SICR is assessed by comparing the risk of default of an exposure at the reporting date with the risk of default at origination (after considering the passage of time). 'Significant' does not mean statistically significant nor is it reflective of the extent of the impact on the Group's financial statements. Whether a change in the risk of default is significant or not is assessed using quantitative and qualitative criteria, the weight of which will depend on the type of product and counterparty.	Quantitative criteria Significant increase in credit risk thresholds Specific qualitative and quantitative criteria per segment: Corporate & Institutional and Commercial Banking clients Retail Banking clients Private Banking clients Debt securities	177 177 177 178 178 178 178
Assessment of credit-impaired financial assets	Credit-impaired financial assets comprise those assets that have experienced an observed credit event and are in default. Default represents those assets that are at least 90 days past due in respect of principal and interest payments and/or where the assets are otherwise considered unlikely to pay. This definition is consistent with internal credit risk management and the regulatory definition of default. Unlikely to pay factors include objective conditions such as bankruptcy, debt restructuring, fraud or death. It also includes credit-related modifications of contractual cash flows due to significant financial difficulty (forbearance) where the Group has granted concessions that it would not ordinarily consider.	Retail Banking clients Corporate & Institutional Banking clients Commercial Banking and Private Banking clients	178 178 178
Modified financial assets	Where the contractual terms of a financial instrument have been modified, and this does not result in the instrument being derecognised, a modification gain or loss is recognised in the income statement representing the difference between the original cashflows and the modified cash flows, discounted at the effective interest rate. The modification gain/loss is directly applied to the gross carrying amount of the instrument. If the modification is credit-related, such as forbearance or where the Group has granted concessions that it would not ordinarily consider, then it will be considered credit-impaired. Modifications that are not credit related will be subject to an assessment of whether the asset's credit risk has increased significantly since origination by comparing the remaining lifetime probability of default (PD) based on the modified terms to the remaining lifetime PD based on the original contractual terms.	Forbearance and other modified loans	257
Transfers between stages	Assets will transfer from stage 3 to stage 2 when they are no longer considered to be credit-impaired. Assets will not be considered credit-impaired only if the customer makes payments such that they are paid to current in line with the original contractual terms. In addition: → Loans that were subject to forbearance measures must remain current for 12 months before they can be transferred to stage 2 → Retail loans that were not subject to forbearance measures must remain current for 180 days before they can be transferred to stage 2 or stage 1 Assets may transfer to stage 1 if they are no longer considered to have experienced a significant increase in credit risk. This will be immediate when the original PD based transfer criteria are no longer met (and as long as none of the other transfer criteria apply). Where assets were transferred using other measures, the assets will only transfer back to stage 1 when the condition that caused the significant increase in credit risk no longer applies (and as long as none of the other transfer criteria apply).	Movement in loan exposures and expected credit losses	156
Governance and application of expert credit judgement in respect of expected credit losses	The determination of expected credit losses requires a significant degree of management judgement which had an impact on governance processes, with the output of the expected credit models assessed by the IFRS 9 Impairment Committee.	Group Credit Model Assessment Committee IFRS 9 Impairment Committee	179 179

Maximum exposure to credit risk

The table below presents the Group's maximum exposure to credit risk for its on-balance sheet and off-balance sheet financial instruments as at 31 December 2018, before and after taking into account any collateral held or other credit risk mitigation.

The Group's on-balance sheet maximum exposure to credit risk increased by $27 billion to $667 billion (1 January 2018: $640 billion). This was driven by a $10 billion increase in investment securities as the Group further strengthened its portfolio of high-quality liquid assets, as well as a $9 billion increase in reverse repos held at fair value through profit or loss primarily in the UK. Investment securities held at fair value through profit or loss increased by $1.8 billion as a result of deployment of funds in better quality assets. Further, other assets increased by $2.8 billion mainly driven by cash collateral and unsettled trades due to settlement timing differences.

Off-balance sheet credit risk exposures increased by $2 billion compared with 1 January 2018, primarily within contingent liabilities, offset by a decrease in documentary credits and short-term trade-related transactions.

	31.12.18				01.01.18			
		Credit risk management				Credit risk management		
	Maximum exposure $million	**Collateral $million**	**Master netting agreements $million**	**Net exposure $million**	Maximum exposure $million	Collateral $million	Master netting agreements $million	Net exposure $million
On-balance sheet								
Cash and balances at central banks	**57,511**			**57,511**	58,864			58,864
Loans and advances to banks[1, 8]	**61,414**	**3,815**		**57,599**	62,295	5,101		57,194
of which – reverse repurchase agreements and other similar secured lending[7]	**3,815**	**3,815**		**–**	5,101	5,101		–
Loans and advances to customers[1, 8]	**256,557**	**109,326**		**147,231**	251,507	118,132		133,375
of which – reverse repurchase agreements and other similar secured lending[7]	**3,151**	**3,151**		**–**	4,566	4,566		–
Investment securities – debt securities and other eligible bills[2]	**125,638**			**125,638**	115,599			115,599
Fair value through profit or loss[3, 7]	**85,441**	**54,769**	**–**	**30,672**	72,505	45,518	–	26,987
Loans and advances to banks	**3,768**			**3,768**	2,865			2,865
Loans and advances to customers	**4,928**			**4,928**	3,907			3,907
Reverse repurchase agreements and other similar lending[7]	**54,769**	**54,769**		**–**	45,518	45,518		–
Investment securities – debt securities and other eligible bills[2]	**21,976**			**21,976**	20,215			20,215
Derivative financial instruments[4, 7]	**45,621**	**9,259**	**32,283**	**4,079**	47,031	9,825	29,135	8,071
Accrued income	**2,228**			**2,228**	1,947			1,947
Assets held for sale	**23**			**23**	2			2
Other assets[5]	**32,678**			**32,678**	29,922			29,922
Total balance sheet	**667,111**	**177,169**	**32,283**	**457,659**	639,672	178,576	29,135	431,961
Off-balance sheet								
Contingent liabilities[6]	**41,952**	**–**	**–**	**41,952**	37,639	–	–	37,639
Undrawn irrevocable standby facilities, credit lines and other commitments to lend[6]	**147,728**	**–**	**–**	**147,728**	147,978	–	–	147,978
Documentary credits and short-term trade-related transactions[6]	**3,982**	**–**	**–**	**3,982**	5,808	–	–	5,808
Total off-balance sheet	**193,662**	**–**	**–**	**193,662**	191,425[9]	–	–	191,425
Total	**860,773**	**177,169**	**32,283**	**651,321**	831,097	178,576	29,135	623,386

1 An analysis of credit quality is set out in the credit quality analysis section (page 146). Further details of collateral held by client segment and stage are set out in the collateral analysis section (page 165)

2 Excludes equity and other investments $263 million (1 January 2018: $214 million)

3 Excludes equity and other investments $1,691 million (1 January 2018: $2,135 million)

4 The Group enters into master netting agreements, which in the event of default result in a single amount owed by or to the counterparty through netting the sum of the positive and negative mark-to-market values of applicable derivative transactions

5 Other assets include Hong Kong certificates of indebtedness, cash collateral, and acceptances, in addition to unsettled trades and other financial assets

6 Excludes ECL allowances which are reported under Provisions for liabilities and charges

7 Collateral capped at maximum exposure (over-collateralised)

8 Covered exposure at default (EAD), being the collateral considered to mitigate (cover) credit risk in the EAD calculation, has been used to understand the effect of collateral and other credit enhancements on the amounts arising from expected credit losses in accordance with IFRS 7 – Financial instrument disclosures

9 Contingent liabilities and commitments have been restated, as a result of the availability of more reliable, centralised information following the implementation of IFRS 9. The ageing of commitments is now based on residual rather than original maturity

	31.12.17 (IAS 39)			
		Credit risk management		
	Maximum exposure $million	Collateral $million	Master netting agreements $million	Net exposure $million
On-balance sheet				
Cash and balances at central banks	58,864	–	–	58,864
Loans and advances to banks[1]	78,188	20,694		57,494
of which – reverse repurchase agreements and other similar secured lending	20,694	20,694		
Loans and advances to customers[1]	282,288	146,641		135,647
of which – reverse repurchase agreements and other similar secured lending	33,581	33,581		
Investment securities – debt securities and other eligible bills[2]	116,131	–	–	116,131
Fair value through profit or loss[3]	26,113	912		25,201
Loans and advances to banks	2,572			2,572
Loans and advances to customers	2,918			2,918
Reverse repurchase agreements and other similar secured lending	912	912	–	–
Investment securities – debt securities and other eligible bills[2]	19,711			19,711
Derivative financial instruments[4]	47,031	9,825	29,135	8,071
Accrued income	1,947	–	–	1,947
Assets held for sale	2	–	–	2
Other assets[5]	29,922	–	–	29,922
Total balance sheet	640,486	178,072	29,135	433,279
Off-balance sheet				–
Contingent liabilities[6]	37,639	–	–	37,639
Undrawn irrevocable standby facilities, credit lines and other commitments to lend[6]	147,978	–	–	147,978
Documentary credits and short-term trade-related transactions[6]	5,808	–	–	5,808
Total off-balance sheet	191,425	–	–	191,425
Total	831,911	178,072	29,135	624,704

1 An analysis of credit quality is set out in the credit quality analysis section (page 146). Further details of collateral held by client segment and stage are set out in the collateral analysis section (page 165)

2 Excludes equity and other investments $894 million

3 Excludes equity and other investments $1,451 million

4 The Group enters into master netting agreements, which in the event of default result in a single amount owed by or to the counterparty through netting the sum of the positive and negative mark-to-market values of applicable derivative transactions

5 Other assets include Hong Kong certificates of indebtedness, cash collateral, and acceptances, in addition to unsettled trades and other financial assets

6 Contingent liabilities and commitments have been restated, as a result of the availability of more reliable, centralised information following the implementation of IFRS 9

Analysis of financial instrument by stage

This table shows financial instruments and off-balance sheet commitments by stage, along with total credit impairment loss provision against each class of financial instrument.

The proportion of financial instruments held within stage 1 increased to 92 per cent, compared with 90 per cent at 1 January 2018. This increase was primarily within Corporate & Institutional Banking loans and advances where the proportion of stage 1 loans rated as 'Strong' has increased from 58 per cent to 62 per cent.

The proportion of stage 2 financial instruments decreased to 7 per cent from 8 per cent at 1 January 2018, primarily from reductions in loans and advances and undrawn commitments. This was largely due to an improvement in the credit quality of the Corporate & Institutional Banking portfolio. Loans held on non-purely precautionary early alert in the Corporate & Institutional Banking and Commercial Banking portfolios declined by $3.9 billion as accounts repaid or regularised. Loans classed as 'Higher risk' increased by 4 per cent primarily within the Commercial Banking segment. The stage 2 cover ratio declined to 2.4 per cent from 2.8 per cent at 1 January 2018 primarily due to improved credit quality together with more high-quality collateral.

The proportion of instruments classified as stage 3 declined by $1.6 billion. This was driven by a combination of repayments, debt sales, write-offs and upgrades within loans and advances to customers. The stage 3 cover ratio (excluding collateral) declined from 60 per cent to 59 per cent over the same period but remained stable including collateral.

	31.12.18											
	Stage 1			Stage 2			Stage 3			Total		
	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million
Loans and advances to banks (amortised cost)	60,350	(5)	60,345	1,070	(1)	1,069	–	–	–	61,420	(6)	61,414
Loans and advances to customers (amortised cost)	237,103	(426)	236,677	17,428	(416)	17,012	6,924	(4,056)	2,868	261,455	(4,898)	256,557
Debt securities and other eligible bills	118,713	(27)		6,909	(31)		232	(206)		125,854	(264)	
Amortised cost	8,225	(7)	8,218	1,062	(3)	1,059	232	(206)	26	9,519	(216)	9,303
FVOCI[2]	110,488	(20)		5,847	(28)		–	–		116,335	(48)	
Undrawn commitments[3]	137,783	(69)		13,864	(39)		63	–		151,710	(108)	
Financial guarantees[3]	38,532	(4)		3,053	(13)		367	(156)		41,952	(173)	
Total	592,481	(531)		42,324	(500)		7,586	(4,418)		642,391	(5,449)	

1 Gross carrying amount for off-balance sheet refers to notional values

2 These instruments are held at fair value on the balance sheet. The ECL provision in respect of debt securities measured at FVOCI is held within reserves

3 These are off-balance sheet instruments. Only the ECL is recorded on-balance sheet as a financial liability and therefore there is no "net carrying amount". ECL allowances on off-balance sheet instruments are held as liability provisions to the extent that the drawn and undrawn components of loan exposures can be separately identified. Otherwise, they will be reported against the drawn component

	01.01.18											
	Stage 1			Stage 2			Stage 3			Total		
	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million	Gross balance[1] $million	Total credit impairment $million	Net carrying value $million
Loans and advances to banks (amortised cost)	59,926	(6)	59,920	2,372	(2)	2,370	9	(4)	5	62,307	(12)	62,295
Loans and advances to customers (amortised cost)	228,485	(472)	228,013	20,583	(576)	20,007	8,769	(5,282)	3,487	257,837	(6,330)	251,507
Debt securities and other eligible bills	107,308	(26)		8,302	(58)		221	(213)		115,831	(297)	
Amortised cost[2]	6,204	(3)	6,201	995	(16)	979	221	(213)	8	7,420	(232)	7,188
FVOCI[3]	101,104	(23)		7,307	(42)		–	–		108,411	(65)	
Undrawn commitments[4]	138,804	(66)		14,982	(90)		–	–		153,786	(156)	
Financial guarantees[4]	31,292	(6)		6,148	(16)		199	(77)		37,639	(99)	
Total	565,815	(576)		52,387	(742)		9,198	(5,576)		627,400	(6,894)	

1 Gross carrying amount for off-balance sheet refers to notional values

2 Stage 3 gross balance and total credit impairment of debt securities and other eligible bills – amortised cost has increased by $208 million, with no impact on net carrying value. The balances have been restated to present securities with zero carrying value previously classified as available-for-sale under IAS 39 on a gross basis as required under IFRS 9

3 These instruments are held at fair value on the balance sheet. The ECL provision in respect of debt securities measured at fair value through other comprehensive income is held within reserves

4 These are off-balance sheet instruments. Only the ECL is recorded on-balance sheet as a financial liability and therefore there is no 'net carrying amount'. ECL allowances on off-balance sheet instruments are held as liability provisions to the extent that the drawn and undrawn components of loan exposures can be separately identified. Otherwise they will be reported against the drawn component. Contingent liabilities and commitments gross balances have been restated, as a result of the availability of more reliable, centralised information following the implementation of IFRS 9

Credit quality analysis

Credit quality by client segment

For Corporate & Institutional Banking and Commercial Banking portfolios, exposures are analysed by credit grade (CG), which plays a central role in the quality assessment and monitoring of risk (page 199). All loans are assigned a CG, which is reviewed periodically and amended in light of changes in the borrower's circumstances or behaviour. CGs 1 to 12 are assigned to stage 1 and stage 2 (performing) clients or accounts, while CGs 13 and 14 are assigned to stage 3 (non-performing or defaulted) clients. The mapping of credit quality is as follows.

Mapping of credit quality

The Group uses the following internal risk mapping to determine the credit quality for loans.

	Corporate & Institutional Banking and Commercial Banking			Private Banking[1]	Retail Banking
Credit quality description	**Default grade mapping**	**S&P external ratings equivalent**	**Regulatory PD range (%)**	**Internal ratings**	**Number of days past due**
Strong	Grades 1–5	AAA/AA+ to BB+/BBB-	0.000–0.425	Class I and Class IV	Current loans (no past dues nor impaired)
Satisfactory	Grades 6–8	BB+ to BB-/B+	0.426–2.350	Class II and Class III	Loans past due till 29 days
	Grades 9–11	B+/B to B-/CCC	2.351–15.750		
Higher Risk	Grade 12	B-/CCC	15.751–50.000	GSAM managed	Past due loans 30 days and over till 90 days

1 For Private Banking, classes of risk represent the type of collateral held. Class I represents facilities with liquid collateral, such as cash and marketable securities. Class II represents unsecured/partially secured facilities and those with illiquid collateral, such as equity in private enterprises. Class III represents facilities with residential or commercial real estate collateral. Class IV covers margin trading facilities

The table overleaf sets out the gross loans and advances held at amortised cost, expected credit loss provisions and expected credit loss coverage by business segment and stage. Expected credit loss coverage represents the expected credit loss reported for each segment and stage as a proportion of the gross loan balance for each segment and stage.

Stage 1 loans increased by 4 per cent compared with 1 January 2018 and represent 91 per cent of total loans and advances to customers as of 31 December 2018. The largest increase of stage 1 loans in any region was $4.1 billion in Europe & Americas. Stage 1 loans in Greater China & North Asia increased by $3.4 billion while ASEAN & South Asia and Africa & Middle East were broadly stable over the year.

The proportion of Corporate & Institutional Banking loans held within stage 1 improved to 87 per cent from 81 per cent at 1 January 2018. This was concentrated in the 'Strong' category which increased from 58 per cent of stage 1 loans at 1 January 2018 to 62 per cent at 31 December 2018, as the Group continued to focus on the origination of investment grade lending.

In Commercial Banking, the proportion of stage 1 loans declined from 79 per cent to 78 per cent due to a small number of downgrades to stage 2. However, the proportion of stage 1 loans categorised as 'Strong' increased from 24 per cent to 25 per cent in line with the Group's strategy to increase the proportion of new loans to higher credit quality clients. Across Corporate & Institutional Banking and Commercial Banking, the largest industry contributors to the growth in stage 1 lending were the manufacturing sector, up $2.8 billion, and loans to governments, up $4.0 billion.

The proportion of Retail Banking stage 1 loans was slightly lower at 96 per cent of the total portfolio compared with 97 per cent at 1 January 2018, with the proportion rated as 'Strong' decreasing from 99 per cent to 98 per cent of total stage 1 loans mainly due to the decrease of the mortgage portfolio and the staging methodology change in the Korea Mortgage portfolio. Stage 1 mortgage loans declined by $4.4 billion, mainly due to tightened regulations in Korea and price competition in Hong Kong which resulted in a reduction in new booking. This was offset by growth of $3.8 billion in secured wealth products and $0.7 billion in credit cards and personal loans (CCPL) and other unsecured lending.

Stage 2 loans fell by $3.2 billion, or 15 per cent, compared with 1 January 2018, primarily driven by a decline in Corporate & Institutional Banking and Commercial Banking non-purely precautionary early alert balances.

In Corporate & Institutional Banking, 73 per cent of stage 2 loans were rated as 'Satisfactory' compared with 59 per cent at 1 January 2018. This does not represent a decline in overall credit quality as it is primarily driven by improvements in stage 2 investment grade loans which repaid or transferred back into stage 1. The majority of stage 2 loans within Commercial Banking continue to be classified as 'Satisfactory' (31 December 2018: 84 per cent; 1 January 2018: 82 per cent). Within Corporate & Institutional Banking and Commercial Banking, overall stage 2 loans decreased by $3.9 billion. The reduction spread across a number of sectors, with the manufacturing and financing and non-banking sectors seeing the largest decreases, $1.3 billion and $1.0 billion respectively, as early alert balances declined.

Retail Banking stage 2 loans increased by $0.7 billion, mainly driven by a change in the staging methodology in the Korea mortgage portfolio. 69 per cent are within the 'Strong' category, and the proportion of past due loans reduced from 34 per cent at 1 January 2018 to 31 per cent at 31 December 2018. Driven by an increase in the proportion of Mortgages held in Stage 2 and the rundown of the high-risk segments in the personal loans portfolio for ASEAN & South Asia, the requirement for ECL coverage has dropped from 7.8 per cent to 4.7 per cent.

Stage 3 loans fell by $1.8 billion, or 21 per cent, compared with 1 January 2018, with overall stage 3 provisions declining by $1.2 billion to $4.1 billion. The stage 3 cover ratio declined to 59 per cent from 60 per cent largely driven by the impact of write-offs and settlements in the liquidation portfolio.

All regions were lower compared with 1 January 2018, with the decline primarily in ASEAN & South Asia. In Corporate & Institutional Banking and Commercial Banking, stage 3 loans fell by $1.9 billion compared with 1 January 2018 due to repayments, debt sales, write-offs and upgrades in Corporate & Institutional Banking. Provisions against Corporate & Institutional Banking and Commercial Banking loans also fell by $1.2 billion from $4.8 billion to $3.6 billion.

Inflows into stage 3 for Corporate & Institutional Banking were 65 per cent lower than 2017 reflecting the continued improvement in the Corporate & Institutional Banking portfolio. Stage 3 inflows increased for Commercial Banking, driven by exposures in Greater China & North Asia and Africa & Middle East with no specific industry concentration. The majority of new stage 3 counterparties in Corporate and Institutional Banking and Commercial Banking in 2018 had been on early alert for a period and do not indicate new areas of stress.

Retail stage 3 loans were broadly stable at $0.8 billion.

Loans and advances by client segment

Amortised cost	Banks $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Customers total $million
	31.12.18						
		Customers					
Stage 1	60,350	93,848	98,393	21,913	12,705	10,244	237,103
– Strong	47,860	58,167	96,506	5,527	9,447	10,193	179,840
– Satisfactory	12,490	35,681	1,887	16,386	3,258	51	57,263
Stage 2	1,070	9,357	2,837	4,423	785	26	17,428
– Strong	403	1,430	1,956	270	713	–	4,369
– Satisfactory	665	6,827	500	3,732	–	26	11,085
– Higher risk	2	1,100	381	421	72	–	1,974
Of which (stage 2):							
– Less than 30 days past due	*27*	*232*	*500*	*198*	*–*	*–*	*930*
– More than 30 days past due	*–*	*190*	*381*	*99*	*3*	*–*	*673*
Stage 3, credit-impaired financial assets	–	4,084	832	1,773	235	–	6,924
Gross balance[1]	61,420	107,289	102,062	28,109	13,725	10,270	261,455
Stage 1	(5)	(94)	(299)	(24)	(9)	–	(426)
– Strong	(2)	(32)	(149)	(1)	(9)	–	(191)
– Satisfactory	(3)	(62)	(150)	(23)	–	–	(235)
Stage 2	(1)	(192)	(132)	(92)	–	–	(416)
– Strong	–	(11)	(42)	(5)	–	–	(58)
– Satisfactory	(1)	(66)	(50)	(45)	–	–	(161)
– Higher risk	–	(115)	(40)	(42)	–	–	(197)
Of which (stage 2):							
– Less than 30 days past due	–	(34)	(50)	(9)	–	–	(93)
– More than 30 days past due	–	(2)	(40)	(4)	–	–	(46)
Stage 3, credit-impaired financial assets	–	(2,326)	(396)	(1,234)	(100)	–	(4,056)
Total credit impairment	(6)	(2,612)	(827)	(1,350)	(109)	–	(4,898)
Net carrying value	61,414	104,677	101,235	26,759	13,616	10,270	256,557
Stage 1	0.0%	0.1%	0.3%	0.1%	0.1%	0.0%	0.2%
– Strong	0.0%	0.1%	0.2%	0.0%	0.1%	0.0%	0.1%
– Satisfactory	0.0%	0.2%	7.9%	0.1%	0.0%	0.0%	0.4%
Stage 2	0.1%	2.1%	4.7%	2.1%	0.0%	0.0%	2.4%
– Strong	0.0%	0.8%	2.1%	1.9%	0.0%	–	1.3%
– Satisfactory	0.2%	1.0%	10.0%	1.2%	–	0.0%	1.5%
– Higher risk	0.0%	10.5%	10.5%	10.0%	0.0%	–	10.0%
Of which (stage 2):							
– Less than 30 days past due	*0.0%*	*14.7%*	*10.0%*	*4.5%*	*–*	*–*	*10.0%*
– More than 30 days past due	*–*	*1.1%*	*10.5%*	*4.0%*	*0.0%*	*–*	*6.8%*
Stage 3, credit-impaired financial assets	–	57.0%	47.6%	69.6%	42.6%	0.0%	58.6%
Cover ratio	0.0%	2.4%	0.8%	4.8%	0.8%	0.0%	1.9%
Fair value through profit or loss							
Performing	20,651	41,886	400	479	–	4	42,769
– Strong	19,515	33,178	395	247	–	3	33,823
– Satisfactory	1,136	8,700	4	232	–	1	8,937
– Higher risk	–	8	1	–	–	–	9
Impaired	–	12	–	33	–	–	45
Gross balance[2]	20,651	41,898	400	512	–	4	42,814
Net carrying value (incl FVTPL)	82,065	146,575	101,635	27,271	13,616	10,274	299,371

1 Loans and advances includes reverse repurchase agreements and other similar secured lending of $3,151 million under Customers and of $3,815 million under Banks, held at amortised cost

2 Loans and advances includes reverse repurchase agreements and other similar secured lending of $37,886 million under Customers and of $16,883 million under Banks, held at fair value through profit or loss

Amortised cost	Banks $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Customers total $million
	01.01.18						
		Customers					
Stage 1	59,926	83,575	99,971	23,130	12,481	9,328	228,485
– Strong	50,820	48,638	98,721	5,573	8,527	9,240	170,699
– Satisfactory	9,106	34,937	1,250	17,557	3,954	88	57,786
Stage 2	2,372	13,639	2,186	4,023	735	–	20,583
– Strong	1,942	4,398	1,432	394	693	–	6,917
– Satisfactory	376	8,113	349	3,306	–	–	11,768
– Higher risk	54	1,128	405	323	42	–	1,898
Of which (stage 2):							
– Less than 30 days past due	*246*	*493*	*349*	*153*	*–*	*–*	*993*
– More than 30 days past due	*25*	*232*	*405*	*123*	*5*	*–*	*767*
Stage 3, credit-impaired financial assets	9	5,788	818	1,956	207	–	8,769
Gross balance[1]	62,307	103,002	102,975	29,109	13,423	9,328	257,837
Stage 1	(6)	(65)	(370)	(25)	(8)	(4)	(472)
– Strong	(4)	(12)	(324)	(5)	(8)	(4)	(353)
– Satisfactory	(2)	(53)	(46)	(20)	–	–	(119)
Stage 2	(2)	(326)	(170)	(79)	(1)	–	(576)
– Strong	(2)	(14)	(84)	–	(1)	–	(99)
– Satisfactory	–	(165)	(25)	(59)	–	–	(249)
– Higher risk	–	(147)	(61)	(20)	–	–	(228)
Of which (stage 2):							
– Less than 30 days past due	–	(65)	(25)	(28)	–	–	(117)
– More than 30 days past due	–	(71)	(61)	(14)	–	–	(146)
Stage 3, credit-impaired financial assets	(4)	(3,433)	(389)	(1,369)	(91)	–	(5,282)
Total credit impairment	(12)	(3,824)	(929)	(1,473)	(100)	(4)	(6,330)
Net carrying value	62,295	99,178	102,046	27,636	13,323	9,324	251,507
ECL coverage							
Stage 1	0.0%	0.1%	0.4%	0.1%	0.1%	0.0%	0.2%
– Strong	0.0%	0.0%	0.3%	0.1%	0.1%	0.0%	0.2%
– Satisfactory	0.0%	0.2%	3.7%	0.1%	0.0%	0.0%	0.2%
Stage 2	0.1%	2.4%	7.8%	2.0%	0.1%	–	2.8%
– Strong	0.1%	0.3%	5.9%	0.0%	0.1%	–	1.4%
– Satisfactory	0.0%	2.0%	7.2%	1.8%	–	–	2.1%
– Higher risk	0.0%	13.0%	15.1%	6.2%	0.0%	–	12.0%
Of which (stage 2):							
– Less than 30 days past due	*0.0%*	*13.2%*	*6.9%*	*18.3%*	*–*	*–*	*11.8%*
– More than 30 days past due	*0.0%*	*30.6%*	*15.0%*	*11.4%*	*0.0%*	*–*	*19.0%*
Stage 3, credit-impaired financial assets	44.4%	59.3%	47.6%	70.0%	44.0%	–	60.2%
Cover ratio	0.0%	3.7%	0.9%	5.1%	0.7%	0.0%	2.5%
Fair value through profit or loss							
Performing	19,022	32,209	539	457	–	–	33,205
– Strong	16,199	22,647	539	100	–	–	23,286
– Satisfactory	2,823	9,555	–	357	–	–	9,912
– Higher risk	–	7	–	–	–	–	7
Impaired	–	59	–	4	–	–	63
Gross balance[2]	19,022	32,268	539	461	–	–	33,268
Net carrying value (incl FVTPL)	81,317	131,446	102,585	28,097	13,323	9,324	284,775

1 Loans and advances includes reverse repurchase agreements and other similar secured lending of $4,566 million under Customers and of $5,101 million under Banks, held at amortised cost

2 Loans and advances includes reverse repurchase agreements and other similar secured lending of $29,361 million under Customers and of $16,157 million under Banks, held at fair value through profit or loss

	31.12.17 (IAS 39)						
		Customers					
	Banks[1] $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Customers total[1] $million
Performing loans							
– Strong	68,958	75,672	100,687	6,072	9,220	9,253	200,904
– Satisfactory	12,309	52,610	1,586	21,216	3,951	90	79,453
– Higher risk	54	1,128	405	323	42	–	1,898
	81,321	129,410	102,678	27,611	13,213	9,343	282,255
Impaired forborne loans, net of provisions	–	–	269	–	–	–	269
Non-performing loans, net of provisions	5	2,484	274	596	140	–	3,494
Total loans	81,326	131,894	103,221	28,207	13,353	9,343	286,018
Portfolio impairment provision	(1)	(156)	(208)	(99)	(2)	–	(465)
Total net loans	81,325	131,738	103,013	28,108	13,351	9,343	285,553

The following table further analyses total loans included within the table above.

	Banks[1] $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Customers total[1] $million
Included in performing loans							
Neither past due nor impaired							
– Strong	68,740	75,482	100,687	6,058	9,220	9,251	200,698
– Satisfactory	12,255	51,846	–	20,831	3,866	90	76,633
– Higher risk	54	899	–	239	42	–	1,180
	81,049	128,227	100,687	27,128	13,128	9,341	278,511
Past due but not impaired							
– Up to 30 days past due	247	951	1,586	360	69	–	2,966
– 31–60 days past due	25	32	278	49	16	–	375
– 61–90 days past due	–	200	127	74	–	2	403
	272	1,183	1,991	483	85	2	3,744
Total performing loans	81,321	129,410	102,678	27,611	13,213	9,343	282,255
of which, forborne loans amounting to	*2*	*480*	*84*	*31*	–	–	*595*
Included in non-performing loans							
Past due but not impaired							
– 91–120 days past due	–	–	67	–	–	–	67
– 121–150 days past due	–	–	56	–	–	–	56
	–	–	123	–	–	–	123
Individually impaired loans, net of provisions	5	2,484	151	596	140	–	3,371
Total non-performing loans	5	2,484	274	596	140	–	3,494
of the above, forborne loans	*4*	*861*	*268*	*186*	–	–	*1,315*

The following table sets out loans held at fair value through profit or loss which are included within the table above.

	Banks[1] $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Customers total[1] $million
Neither past due nor impaired							
– Strong	2,081	1,451	–	30	–	–	1,481
– Satisfactory	1,056	1,572	–	186	–	–	1,758
– Higher risk	–	7	–	–	–	–	7
	3,137	3,030	–	216	–	–	3,246
Individually impaired loans	–	19	–	–	–	–	19
Total loans held at fair value through profit or loss	3,137	3,049	–	216	–	–	3,265

1 Loans and advances includes reverse repurchase agreements and other similar secured lending of $55,187 million

Credit quality by geographic region (unaudited)

The following table sets out the credit quality for gross loans and advances to customers and banks, held at amortised cost, by geographic region and stage.

Loans and advances to customers

Amortised cost	31.12.18 Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Stage 1	**118,422**	**71,169**	**23,598**	**23,914**	**237,103**
Stage 2	**4,139**	**7,628**	**5,112**	**549**	**17,428**
Gross stage 1 & stage 2 balance	**122,561**	**78,797**	**28,710**	**24,463**	**254,531**
Stage 3, credit-impaired financial assets	**777**	**2,730**	**2,573**	**844**	**6,924**
Gross loans[1]	**123,338**	**81,527**	**31,283**	**25,307**	**261,455**

Amortised cost	01.01.18 Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Stage 1	114,990	70,594	23,120	19,781	228,485
Stage 2	5,796	7,578	4,762	2,447	20,583
Gross stage 1 & stage 2 balance	120,786	78,172	27,882	22,228	249,068
Stage 3, credit-impaired financial assets[2]	806	4,248	2,657	1,058	8,769
Gross loans[1]	121,592	82,420	30,539	23,286	257,837

1 Amounts gross of expected credit losses. Includes reverse repurchase agreements and other similar secured lending

2 Amounts do not include those purchased or originated credit-impaired financial assets

Amortised cost	31.12.17 (IAS 39) Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Neither past due nor individually impaired	125,565	79,175	27,774	45,997	278,511
Past due but not individually impaired	809	1,711	1,153	194	3,867
Individually impaired	806	4,233	2,654	1,184	8,877
Individual impairment provision	(312)	(2,361)	(1,858)	(706)	(5,237)
Portfolio impairment provisions	(129)	(179)	(121)	(36)	(465)
Net carrying value[1]	126,739	82,579	29,602	46,633	285,553

1 Excludes impairment charges relating to debt securities classified as loans and receivables, refer to Note 8 to the financial statements for details (page 254)

Loans and advances to banks

Amortised cost	31.12.18 Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Stage 1	27,801	11,095	5,374	16,080	60,350
Stage 2	59	582	199	230	1,070
Gross stage 1 & stage 2 balance	27,860	11,677	5,573	16,310	61,420
Stage 3, credit-impaired financial assets	–	–	–	–	–
Gross loans[1]	27,860	11,677	5,573	16,310	61,420

Amortised cost	01.01.18 Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Stage 1	28,792	11,853	4,425	14,856	59,926
Stage 2	1,212	557	169	434	2,372
Gross stage 1 & stage 2 balance	30,004	12,410	4,594	15,290	62,298
Stage 3, credit-impaired financial assets[2]	–	–	–	9	9
Gross loans[1]	30,004	12,410	4,594	15,299	62,307

1 Amounts gross of expected credit losses. Includes reverse repurchase agreements and other similar secured lending

2 Amounts do not include those purchased or originated credit-impaired financial assets

Amortised cost and FVTPL	31.12.17 (IAS 39) Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Neither past due nor individually impaired	33,096	16,482	7,328	24,143	81,049
Past due but not individually impaired	130	41	101	–	272
Individually impaired	–	–	–	9	9
Individual impairment provision	–	–	–	(4)	(4)
Portfolio impairment provision	–	–	(1)	–	(1)
Net carrying value[1]	33,226	16,523	7,428	24,148	81,325

1 Excludes impairment charges relating to debt securities classified as loans and receivables, refer to Note 8 to the financial statements for details (page 254)

Credit quality by industry (unaudited)

Loans and advances

This section provides an analysis of the Group's amortised cost portfolio by industry on a gross, total credit impairment and net basis.

The Group has reduced exposures across the energy and construction sectors primarily within stage 2 and stage 3, while increasing exposures in stage 1 across manufacturing, government and financing, insurance and non-banking.

	31.12.18											
	Stage 1			Stage 2			Stage 3			Total		
Amortised cost	Gross balance $million	Total credit impairment $million	Net carrying amount $million	Gross balance $million	Total credit impairment $million	Net carrying amount $million	Gross balance $million	Total credit impairment $million	Net carrying amount $million	Gross balance $million	Total credit impairment $million	Net carrying amount $million
Industry:												
Energy	14,530	(18)	14,512	2,198	(46)	2,152	890	(554)	336	17,618	(618)	17,000
Manufacturing	21,627	(23)	21,604	1,932	(86)	1,846	719	(530)	189	24,278	(639)	23,639
Financing, insurance and non-banking	20,419	(7)	20,412	379	(10)	369	225	(119)	106	21,023	(136)	20,887
Transport, telecom and utilities	12,977	(21)	12,956	2,495	(25)	2,470	818	(474)	344	16,290	(520)	15,770
Food and household products	7,558	(7)	7,551	1,851	(15)	1,836	718	(376)	342	10,127	(398)	9,729
Commercial real estate	13,516	(16)	13,500	1,299	(27)	1,272	342	(79)	263	15,157	(122)	15,035
Mining and quarrying	4,845	(7)	4,838	1,047	(29)	1,018	439	(309)	130	6,331	(345)	5,986
Consumer durables	7,328	(5)	7,323	906	(13)	893	534	(348)	186	8,768	(366)	8,402
Construction	2,565	(4)	2,561	512	(22)	490	636	(385)	251	3,713	(411)	3,302
Trading companies and distributors	2,512	(2)	2,510	385	(2)	383	353	(239)	114	3,250	(243)	3,007
Government	13,488	(1)	13,487	250	–	250	–	–	–	13,738	(1)	13,737
Other	4,639	(7)	4,632	552	(8)	544	183	(147)	36	5,374	(162)	5,212
Retail Products:												
Mortgage	73,437	(9)	73,428	1,936	(9)	1,927	343	(98)	245	75,716	(116)	75,600
CCPL and other unsecured lending	16,622	(277)	16,345	560	(117)	443	437	(263)	174	17,619	(657)	16,962
Auto	670	(2)	668	4	–	4	1	–	1	675	(2)	673
Secured wealth products	17,074	(18)	17,056	825	(5)	820	236	(112)	124	18,135	(135)	18,000
Other	3,296	(2)	3,294	297	(2)	295	50	(23)	27	3,643	(27)	3,616
Net carrying value (customers)[1]	237,103	(426)	236,677	17,428	(416)	17,012	6,924	(4,056)	2,868	261,455	(4,898)	256,557

1 Includes reverse repurchase agreements and other similar secured lending held at amortised cost of $3,151 million

Amortised cost	Stage 1 Gross balance $million	Stage 1 Total credit impairment $million	Stage 1 Net carrying amount $million	Stage 2 Gross balance $million	Stage 2 Total credit impairment $million	Stage 2 Net carrying amount $million	Stage 3 Gross balance $million	Stage 3 Total credit impairment $million	Stage 3 Net carrying amount $million	Total Gross balance $million	Total Total credit impairment $million	Total Net carrying amount $million
	01.01.18											
Industry:												
Energy	14,679	(15)	14,664	3,050	(78)	2,972	1,442	(913)	529	19,171	(1,006)	18,165
Manufacturing	18,848	(9)	18,839	3,254	(77)	3,177	801	(614)	187	22,903	(700)	22,203
Financing, insurance and non-banking	18,275	(17)	18,258	1,341	(9)	1,332	403	(179)	224	20,019	(205)	19,814
Transport, telecom and utilities	12,482	(11)	12,471	3,031	(89)	2,942	753	(397)	356	16,266	(497)	15,769
Food and household products	7,707	(7)	7,700	1,933	(41)	1,892	757	(423)	334	10,397	(471)	9,926
Commercial real estate	13,452	(16)	13,436	919	(41)	878	385	(44)	341	14,756	(101)	14,655
Mining and quarrying	5,046	(3)	5,043	1,038	(11)	1,027	952	(674)	278	7,036	(688)	6,348
Consumer durables	7,108	(4)	7,104	1,155	(18)	1,137	728	(553)	175	8,991	(575)	8,416
Construction	2,546	(3)	2,543	792	(31)	761	786	(493)	293	4,124	(527)	3,597
Trading companies and distributors	1,862	(1)	1,861	290	2	292	463	(336)	127	2,615	(335)	2,280
Government	9,521	(1)	9,520	78	(1)	77	6	(1)	5	9,605	(3)	9,602
Other	4,507	(7)	4,500	781	(11)	770	268	(175)	93	5,556	(193)	5,363
Retail Products:												
Mortgage	77,858	(8)	77,850	758	–	758	280	(131)	149	78,896	(139)	78,757
CCPL and other unsecured lending	15,959	(337)	15,622	685	(163)	522	505	(234)	271	17,149	(734)	16,415
Auto	626	(3)	623	6	(1)	5	1	–	1	633	(4)	629
Secured wealth products	13,301	(14)	13,287	720	(1)	719	197	(93)	104	14,218	(108)	14,110
Other	4,708	(16)	4,692	752	(6)	746	42	(22)	20	5,502	(44)	5,458
Net carrying value (customers)[1]	228,485	(472)	228,013	20,583	(576)	20,007	8,769	(5,282)	3,487	257,837	(6,330)	251,507

1 Includes reverse repurchase agreements and other similar secured lending held at amortised cost of $4,566 million

	31.12.17 (IAS 39)								
						Movements in impairment			
Amortised cost and FVTPL	Neither past due nor individually impaired $million	Past due but not individually impaired $million	Individually impaired $million	Individual impairment provision $million	Total $million	Individual impairment provision held as at 1 Jan 2017 $million	Net impairment charge/ (release) $million	Amounts written off/other movements $million	Individual impairment provision held as at 31 Dec 2017 $million
Industry:									
Energy	18,090	116	1,217	(879)	18,544	814	208	(143)	879
Manufacturing	22,085	397	860	(611)	22,731	644	250	(283)	611
Financing, insurance and non-banking	44,439	314	444	(213)	44,984	409	79	(275)	213
Transport, telecom and utilities	15,640	123	777	(376)	16,164	218	230	(72)	376
Food and household products	9,543	179	756	(422)	10,056	561	75	(214)	422
Commercial real estate	14,574	199	400	(34)	15,139	33	9	(8)	34
Mining and quarrying	6,063	64	1,297	(783)	6,641	1,140	26	(383)	783
Consumer durables	8,792	132	725	(583)	9,066	523	124	(64)	583
Construction	3,346	60	781	(484)	3,703	553	59	(128)	484
Trading companies and distributors	2,155	43	458	(331)	2,325	310	46	(25)	331
Government	14,390	25	6	(1)	14,420	–	(1)	2	1
Other	5,579	16	252	(176)	5,671	195	37	(54)	178
Retail Products:									
Mortgage	77,279	1,340	276	(117)	78,778	104	34	(21)	117
CCPL and other unsecured lending	16,700	610	360	(135)	17,535	140	398	(405)	133
Auto	588	45	–	–	633	–	1	(1)	–
Secured wealth products	13,969	57	198	(70)	14,154	4	28	38	70
Other	5,279	147	70	(22)	5,474	19	19	(16)	22
Gross carrying value (customers)[1]	278,511	3,867	8,877	(5,237)	286,018				
Individual impairment provision						5,667	1,622	(2,052)	5,237
Portfolio impairment provision					(465)	687	(239)	17	465
Net carrying value (customers)					285,553	6,354	1,383	(2,035)	5,702

1 Includes loans held at fair value through profit or loss $2,918 million and reverse repurchase agreements held at amortised cost $33,581 million and fair value through profit or loss $347 million

Movement in gross exposures and credit impairment for loans and advances, debt securities, undrawn commitments and financial guarantees

The tables overleaf set out the movement in gross exposures and credit impairment by stage in respect of amortised cost loans to banks and customers, undrawn committed facilities, undrawn cancellable facilities, debt securities classified at amortised cost and FVOCI and financial guarantees. The tables are presented for the Group, and the Corporate & Institutional Banking, Commercial Banking and Retail Banking segments.

Methodology

The movement lines within the tables are an aggregation of monthly movements over the year and will therefore reflect the accumulation of multiple trades during the year. The credit impairment charge in the income statement comprises the amounts within the boxes in the table below less recoveries of amounts previously written off.

The approach for determining the key line items in the tables is set out below.

- **Transfers** – transfers between stages are deemed to occur at the beginning of a month based on prior month closing balances
- **Net remeasurement from stage changes** – the remeasurement of credit impairment provisions arising from a change in stage is reported within the stage that the assets are transferred to. For example, assets transferred into stage 2 are remeasured from a 12 month to a lifetime expected credit loss, with the effect of remeasurement reported in stage 2. For stage 3, this represents the initial remeasurement from specific provisions recognised on individual assets transferred into stage 3 in the year
- **Net changes in exposures** – comprises new business written less repayments in the year. Within stage 1, new business written will attract up to 12 months of expected credit loss charges. Repayments of non-amortising loans (primarily within Corporate & Institutional Banking and Commercial Banking) will have low amounts of expected credit loss provisions attributed to them, due to the release of provisions over the term to maturity. In stages 2 and 3, the amounts principally reflect repayments although stage 2 may include new business written where clients are on non-purely precautionary early alert, are a credit grade 12, or when non-investment grade debt securities are acquired
- **Changes in risk parameters** – for stages 1 and 2, this reflects changes in the probability of default (PD), loss given default (LGD) and exposure at default (EAD) of assets during the year, which includes the impact of releasing provisions over the term to maturity. It also includes the effect of changes in forecasts of macroeconomic variables during the year. In stage 3, this line represents additional specific provisions recognised on exposures held within stage 3

Movements during the year

For Corporate & Institutional Banking and Commercial Banking businesses, the gross exposures in stage 1 increased from $292 billion at 1 January 2018 to $305 billion at 31 December 2018, primarily due to new business written within Corporate & Institutional Banking. This contributed to the increase in stage 1 provisions from $154 million to $181 million offset by improvements in credit quality across the portfolio. Within stage 2 gross exposures and credit impairment provisions declined compared with 1 January 2018, largely driven by a lower level of exposures within Corporate & Institutional Banking on non-purely precautionary early alert, which either repaid or transferred back to stage 1.

Retail Banking stage 1 exposures increased by $2 billion to $133 billion at 31 December 2018, driven by increased lending of secured wealth products, which along with portfolio quality improvements resulted in stage 1 provisions reducing from $381 million to $313 million. Stage 2 exposures increased from $8 billion at 1 January 2018 to $8.9 billion at 31 December 2018, largely due to increased inflows of mortgages, which contributed to a reduction in stage 2 provisions from $178 million at 1 January 2018 to $132 million at 31 December 2018. The increase in provisions from 'Changes in risk parameters' within stage 2 reflects the normal flow of accounts and is not in itself an indicator that there is a significant weakness in the portfolio.

Across both stage 1 and stage 2 for all segments, the improvement in macroeconomic forecasts during the year reduced stage 1 and 2 provisions by $42 million within an overall benign environment.

Across all segments, at 31 December 2018 approximately 35 per cent of gross exposures held in stage 2 are as a result of meeting the PD significant increase in credit risk thresholds, 24 per cent as a result of having 'higher risk' credit quality, 13 per cent due to being on non-purely precautionary early alert, 11 per cent being more than 30 days past due with the remainder primarily relating to Private Banking and other factors.

Stage 3 exposures fell from $9.2 billion at 1 January 2018 to $7.6 billion at 31 December, primarily due to repayments and write-offs within Corporate & Institutional Banking and Commercial Banking, and this was also reflected in lower stage 3 provisions, which fell from $5.6 billion at 1 January 2018 to $4.4 billion at 31 December 2018.

All segments

Amortised cost and FVOCI	Stage 1 Gross exposure $million	Stage 1 Total credit impairment $million	Stage 1 Net $million	Stage 2 Gross exposure $million	Stage 2 Total credit impairment $million	Stage 2 Net $million	Stage 3 Gross exposure $million	Stage 3 Total credit impairment $million	Stage 3 Net $million	Total Gross exposure $million	Total Total credit impairment $million	Total Net $million
As at 1 January 2018	565,815	(576)	565,239	52,387	(742)	51,645	9,198	(5,576)	3,622	627,400	(6,894)	620,506
Transfers to stage 1	59,776	(627)	59,149	(59,776)	627	(59,149)	–	–	–	–	–	–
Transfers to stage 2	(73,589)	136	(73,453)	73,809	(136)	73,673	(220)	–	(220)	–	–	–
Transfers to stage 3	(293)	7	(286)	(2,338)	264	(2,074)	2,631	(271)	2,360	–	–	–
Net change in exposures	50,249	(282)	49,967	(20,341)	94	(20,247)	(1,836)	527	(1,309)	28,072	339	28,411
Net remeasurement from stage changes	–	139	139	–	(136)	(136)	–	(529)	(529)	–	(526)	(526)
Changes in risk parameters	–	468	468	–	(275)	(275)	–	971	(971)	–	(778)	(778)
Write-offs	–	–	–	–	–	–	(2,075)	2,075	–	(2,075)	2,075	–
Exchange translation differences and other movements[1]	(9,477)	204	(9,273)	(1,417)	(196)	(1,613)	(112)	327	215	(11,006)	335	(10,671)
As at 31 December 2018	592,481	(531)	591,950	42,324	(500)	41,824	7,586	(4,418)	3,168	642,391	(5,449)	636,942
Income statement ECL (charge)/release		325			(317)			(973)			(965)	
Recoveries of amounts previously written off								312			312	
Total credit impairment (charge)/release		325			(317)			(661)			(653)	

1 Includes fair value adjustments and amortisation on debt securities

Corporate & Institutional Banking

Amortised cost and FVOCI	Stage 1 Gross exposure $million	Stage 1 Total credit impairment $million	Stage 1 Net $million	Stage 2 Gross exposure $million	Stage 2 Total credit impairment $million	Stage 2 Net $million	Stage 3 Gross exposure $million	Stage 3 Total credit impairment $million	Stage 3 Net $million	Total Gross exposure $million	Total Total credit impairment $million	Total Net $million
As at 1 January 2018	263,079	(114)	262,965	29,576	(409)	29,167	5,951	(3,504)	2,447	298,606	(4,027)	294,579
Transfers to stage 1	40,196	(156)	40,040	(40,196)	156	(40,040)	–	–	–	–	–	–
Transfers to stage 2	(39,490)	30	(39,460)	39,692	(30)	39,662	(202)	–	(202)	–	–	–
Transfers to stage 3	–	–	–	(1,129)	85	(1,044)	1,129	(85)	1,044	–	–	–
Net change in exposures	12,869	(183)	12,686	(8,639)	10	(8,629)	(1,064)	377	(687)	3,166	204	3,370
Net remeasurement from stage changes	–	46	46	–	(30)	(30)	–	(277)	(277)	–	(261)	(261)
Changes in risk parameters	–	101	101	–	140	140	–	(394)	(394)	–	(153)	(153)
Write-offs	–	–	–	–	–	–	(1,208)	1,208	–	(1,208)	1,208	–
Exchange translation differences and other movements	(3,418)	131	(3,287)	(252)	(157)	(409)	(133)	209	76	(3,803)	183	(3,620)
As at 31 December 2018	273,236	(145)	273,091	19,052	(235)	18,817	4,473	(2,466)	2,007	296,761	(2,846)	293,915
Income statement ECL (charge)/release		(36)			120			(294)			(210)	
Recoveries of amounts previously written off								77			77	
Total credit impairment (charge)/release		(36)			120			(217)			(133)	

Commercial Banking

Amortised cost and FVOCI	Stage 1 Gross exposure $million	Stage 1 Total credit impairment $million	Stage 1 Net $million	Stage 2 Gross exposure $million	Stage 2 Total credit impairment $million	Stage 2 Net $million	Stage 3 Gross exposure $million	Stage 3 Total credit impairment $million	Stage 3 Net $million	Total Gross exposure $million	Total Total credit impairment $million	Total Net $million
As at 1 January 2018	28,792	(40)	28,752	5,382	(95)	5,287	2,000	(1,379)	621	36,174	(1,514)	34,660
Transfers to stage 1	12,675	(64)	12,611	(12,675)	64	(12,611)	–	–	–	–	–	–
Transfers to stage 2	(11,152)	26	(11,126)	11,171	(26)	11,145	(19)	–	(19)	–	–	–
Transfers to stage 3	(11)	–	(11)	(606)	14	(592)	617	(14)	603	–	–	–
Net change in exposures	2,163	(65)	(2,098)	3,660	9	3,669	(337)	138	(199)	5,486	82	5,568
Net remeasurement from stage changes	–	12	12	–	(13)	(13)	–	(217)	(217)	–	(218)	(218)
Changes in risk parameters	–	67	67	–	(33)	(33)	–	(162)	(162)	–	(128)	(128)
Write-offs	–	–	–	–	–	–	(293)	293	–	(293)	293	–
Exchange translation differences and other movements	(1,047)	29	(1,018)	(223)	(20)	(243)	(155)	93	(62)	(1,425)	102	(1,323)
As at 31 December 2018	31,420	(35)	31,385	6,709	(100)	6,609	1,813	(1,248)	565	39,942	(1,383)	38,559
Income statement ECL (charge)/release		14			(37)			(241)			(264)	
Recoveries of amounts previously written off								21			21	
Total credit impairment (charge)/release		14			(37)			(220)			(243)	

Retail Banking

Amortised cost and FVOCI	Stage 1 Gross exposure $million	Stage 1 Total credit impairment $million	Stage 1 Net $million	Stage 2 Gross exposure $million	Stage 2 Total credit impairment $million	Stage 2 Net $million	Stage 3 Gross exposure $million	Stage 3 Total credit impairment $million	Stage 3 Net $million	Total Gross exposure $million	Total Total credit impairment $million	Total Net $million
As at 1 January 2018	131,280	(381)	130,899	7,964	(178)	7,786	818	(389)	429	140,062	(948)	139,114
Transfers to stage 1	5,570	(388)	5,182	(5,570)	388	(5,182)	–	–	–	–	–	–
Transfers to stage 2	(9,954)	74	(9,880)	9,954	(74)	9,880	–	–	–	–	–	–
Transfers to stage 3	(281)	8	(273)	(511)	164	(347)	792	(172)	620	–	–	–
Net change in exposures	9,858	(17)	9,841	(2,628)	78	(2,550)	(398)	–	(398)	6,832	61	6,893
Net remeasurement from stage changes	–	72	72	–	(90)	(90)	–	(12)	(12)	–	(30)	(30)
Changes in risk parameters	–	264	264	–	(373)	(373)	–	(402)	(402)	–	(511)	(511)
Write-offs	–	–	–	–	–	–	(575)	575	–	(575)	575	–
Exchange translation differences and other movements	(2,989)	55	(2,934)	(322)	(47)	(369)	195	6	201	(3,116)	14	(3,102)
As at 31 December 2018	133,484	(313)	133,171	8,887	(132)	8,755	832	(394)	438	143,203	(839)	142,364
Income statement ECL (charge)/release		319			(385)			(414)			(480)	
Recoveries of amounts previously written off								214			214	
Total credit impairment (charge)/release		319			(385)			(200)			(266)	

Credit impairment charge

The total ongoing credit impairment charge decreased significantly to $740 million in 2018 (2017: $1.2 billion), down 38 per cent primarily due to improvements in portfolio quality driven by significant actions taken since 2016 to improve the Group's credit quality.

The ongoing business credit impairment charge in Corporate & Institutional Banking of $229 million for 2018 is 65 per cent lower than 2017. This was due to lower stage 3 impairment which was driven by lower losses particularly in ASEAN & South Asia and recoveries from a small number of major exposures in India and the Middle East.

Commercial Banking ongoing business credit impairment charge increased by 45 per cent (2018: $244 million, 2017: $168 million) compared to 2017, which saw a release of $63 million of portfolio impairment provisions held against certain sectors of the portfolios that were no longer required. Africa & Middle East contributed 60 per cent of the full-year 2018 charge.

Retail Banking credit impairment reduced 29 per cent (2018: $267 million, 2017: $374 million), mainly driven by continued improvement in portfolio shape and performance, particularly within the unsecured portfolios, as well as one-off provision releases in Korea and Indonesia.

Stage 3 reductions were partly offset by lower releases of $12 million in stage 1 and 2 compared to Portfolio Impairment Provisions (PIP under IAS 39) as 2017 benefited from material releases of PIP specific risk adjustments of $190 million.

In the liquidation portfolio, there was a net release of $79 million due to loan disposals and repayments.

	31.12.18 $million (IFRS 9)	31.12.17 $million (IAS 39)
Ongoing business portfolio		
Corporate & Institutional Banking	229[1]	657
Retail Banking	267	374
Commercial Banking	244	168
Private Banking	–	1
Credit impairment charge	740	1,200
Restructuring business portfolio		
Liquidation portfolio	(79)	120
Others	(8)	42
Credit impairment charge	(87)	162
Total credit impairment charge	653	1,362

1 Credit impairment recovery of $13 million in Central & other items is included in Corporate & Institutional Banking

Problem credit management and provisioning

Forborne and other modified loans by client segment

A forborne loan arises when a concession has been made to the contractual terms of a loan in response to a customer's financial difficulties.

The table below presents stage 2 and stage 3 loans with forbearance measures by segment.

	31.12.18						
Amortised cost	Loans to banks $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Total $million
All loans with forbearance measures	–	1,445	376	709	–	–	2,530
Credit impairment (stage 3)	–	(517)	(174)	(427)	–	–	(1,118)
Net carrying value	–	928	202	282	–	–	1,412
Included within the above table							
Gross performing forborne loans	–	286	23	71	–	–	380
Modification of terms and conditions[1]	–	273	23	64	–	–	360
Refinancing[2]	–	13	–	7	–	–	20
Collateral	–	16	23	28	–	–	67
Gross non-performing forborne loans	–	1,159	353	638	–	–	2,150
Modification of terms and conditions[1]	–	1,092	353	610	–	–	2,055
Refinancing[2]	–	67	–	28	–	–	95
Impairment provisions	–	(517)	(174)	(427)	–	–	(1,118)
Modification of terms and conditions[1]	–	(489)	(174)	(409)	–	–	(1,072)
Refinancing[2]	–	(28)	–	(18)	–	–	(46)
Net non-performing forborne loans	–	642	179	211	–	–	1,032
Collateral	–	225	163	107	–	–	495

1 Modification of terms is any contractual change apart from refinancing, as a result of credit stress of the counterparty, i.e. interest reductions, loan covenant waivers

2 Refinancing is a new contract to a lender in credit stress, such that they are refinanced and can pay other debt contracts that they were unable to honour

Amortised cost	01.01.18 Loans to banks $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Total $million
All loans with forbearance measures	6	2,143	797	612	–	–	3,558
Credit impairment (stage 3)	–	(802)	(176)	(394)	–	–	(1,372)
Net balance	6	1,341	621	218	–	–	2,186
Included within the above table							
Gross performing forborne loans	2	480	353	31	–	–	866
Modification of terms and conditions[1]	2	480	353	28	–	–	863
Refinancing[2]	–	–	–	3	–	–	3
Collateral	–	4	2	–	–	–	6
Gross non-performing forborne loans	4	1,663	384	581	–	–	2,632
Modification of terms and conditions[1]	4	1,314	384	524	–	–	2,226
Refinancing[2]	–	349	–	57	–	–	406
Impairment provisions	–	(802)	(116)	(394)	–	–	(1,312)
Modification of terms and conditions[1]	–	(554)	(116)	(364)	–	–	(1,034)
Refinancing[2]	–	(248)	–	(30)	–	–	(278)
Net non-performing forborne loans	4	861	268	187	–	–	1,320
Collateral	–	52	20	34	–	–	106

1 Modification of terms is any contractual change apart from refinancing, as a result of credit stress of the counterparty, i.e. interest reductions, loan covenant waivers

2 Refinancing is a new contract to a lender in credit stress, such that they are refinanced and can pay other debt contracts that they were unable to honour

	31.12.17 (IAS 39) Loans to banks $million	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Total $million
All loans with forbearance measures	6	2,143	797	647	–	–	3,593
Accumulated impairment	–	(802)	(176)	(430)	–	–	(1,408)
Net balance	6	1,341	621	217	–	–	2,185
Included within the above table							
Gross performing forborne loans	2	480	353	31	–	–	866
Modification of terms and conditions[1]	2	480	353	28	–	–	863
Refinancing[2]	–	–	–	3	–	–	3
Collateral	–	4	2	–	–	–	6
Gross non-performing forborne loans	4	1,663	384	616	–	–	2,667
Modification of terms and conditions[1]	4	1,314	384	559	–	–	2,261
Refinancing[2]	–	349	–	57	–	–	406
Impairment provisions	–	(802)	(116)	(430)	–	–	(1,348)
Modification of terms and conditions[1]	–	(554)	(116)	(400)	–	–	(1,070)
Refinancing[2]	–	(248)	–	(30)	–	–	(278)
Net non-performing forborne loans	4	861	268	186	–	–	1,319
Collateral	–	52	20	34	–	–	106

1 Modification of terms is any contractual change apart from refinancing, as a result of credit stress of the counterparty, i.e. interest reductions, loan covenant waivers

2 Refinancing is a new contract to a lender in credit stress, such that they are refinanced and can pay other debt contracts that they were unable to honour

Forborne and other modified loans by region (unaudited)

Amortised cost	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
	31.12.18				
Not impaired	114	109	113	44	380
Impaired	233	344	179	276	1,032
Total forborne loans	347	453	292	320	1,412

Amortised cost	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
	31.12.17 (IAS 39)				
Not impaired	56	40	395	106	597
Impaired	353	778	202	255	1,588
Total forborne loans	409	818	597	361	2,185

Credit-impaired (stage 3) loans and advances by client segment

Gross credit-impaired (stage 3) loans for the Group are down 21 per cent in the year, to $6.9 billion (1 January 2018: $8.8 billion) with significant reductions in the liquidation portfolio as we continued to exit these exposures. Gross stage 3 loans in the ongoing business decreased to $5.6 billion (1 January 2018: $6.5 billion), driven by repayments, debt sales, write-offs and transfers to stage 2 in Corporate & Institutional Banking.

The inflows of stage 3 loans in Corporate & Institutional Banking were also significantly lower, at around 35 per cent of the level seen in 2017 (2018: $0.8 billion; 2017: $2.3 billion), reflecting the continued improvement in the Corporate & Institutional Banking portfolio. Stage 3 inflows in Commercial Banking were higher (2018: $0.6 billion; 2017: $0.4 billion), driven by exposures in Greater China & North Asia and Africa & Middle East. Stage 3 loans in Retail Banking were broadly stable (31 December 2018: $0.8 billion; 1 January 2018: $0.8 billion).

Stage 3 cover ratio

The stage 3 cover ratio measures the proportion of stage 3 impairment provisions to gross stage 3 loans, and is a metric commonly used in considering impairment trends. This metric does not allow for variations in the composition of stage 3 loans and should be used in conjunction with other credit risk information provided, including the level of collateral cover.

The cover ratio before collateral for Corporate & Institutional Banking reduced from 59 per cent to 57 per cent due to debt sales and write-offs on clients who had a high level of provisions. The cover ratio for Retail Banking remained stable at 48 per cent and cover ratio including collateral improved to 87 per cent (1 January 2018: 74 per cent).

The Private Banking segment remains fully covered taking into account the collateral held.

The balance of stage 3 loans not covered by stage 3 impairment provisions represents the adjusted value of collateral held and the net outcome of any workout or recovery strategies.

Collateral provides risk mitigation to some degree in all client segments and supports the credit quality and cover ratio assessments post impairment provisions. Further information on collateral is provided in the credit risk mitigation section.

The table below presents the balance of the gross stage 3 loans to banks and customers, together with the provisions held, for all segments and the respective cover ratios. For the reconciliation between the non-performing loans under IAS 39 and under IFRS 9, refer to Note 41.

Amortised cost	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Total $million
	31.12.18				
Gross credit-impaired	4,084	832	1,773	235	6,924
Credit impairment provisions	(2,326)	(396)	(1,234)	(100)	(4,056)
Net credit-impaired	1,758	436	539	135	2,868
Cover ratio	57%	48%	70%	43%	59%
Collateral ($ million)	802	324	302	135	1,563
Cover ratio (after collateral)	77%	87%	87%	100%	81%
Of the above, included in the liquidation portfolio:					
Gross credit-impaired	1,029	–	89	157	1,275
Credit impairment provisions	(780)	–	(89)	(93)	(962)
Net credit-impaired	249	–	–	64	313
Cover ratio	76%	–	100%	59%	75%
Collateral ($ million)	159	–	–	64	223
Cover ratio (after collateral)	91%	–	100%	100%	93%

Amortised cost	01.01.18 Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Total $million
Gross credit-impaired	5,797	818	1,956	207	8,778
Credit impairment provisions	(3,437)	(389)	(1,369)	(91)	(5,286)
Net credit-impaired	2,360	429	587	116	3,492
Cover ratio	59%	48%	70%	44%	60%
Collateral ($ million)	1,111	218	277	203	1,809
Cover ratio (after collateral)	78%	74%	84%	100%	81%
Of the above, included in the liquidation portfolio:					
Gross credit-impaired	1,945	–	125	156	2,226
Credit impairment provisions	(1,417)	–	(123)	(86)	(1,626)
Net credit-impaired	528	–	2	70	600
Cover ratio	73%	–	98%	55%	73%
Collateral ($ million)	237	–	–	96	333
Cover ratio (after collateral)	85%	–	98%	100%	88%

Amortised cost and FVTPL	31.12.17 (IAS 39) Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Total $million
Gross non-performing loans	5,957	489	2,026	207	8,679
Individual impairment provisions[1]	(3,468)	(215)	(1,430)	(67)	(5,180)
Net non-performing loans	2,489	274	596	140	3,499
Portfolio impairment provision	(157)	(208)	(99)	(2)	(466)
Total	2,332	66	497	138	3,033
Cover ratio	61%	87%	75%	33%	65%
Cover ratio (excluding PIP)	58%	44%	71%	32%	60%
Collateral ($ million)	1,111	218	277	203	1,809
Cover ratio (after collateral)	77%	89%	84%	100%	81%
Of the above, included in the liquidation portfolio:					
Gross credit-impaired	1,945	–	125	156	2,226
Credit impairment provisions	(1,388)	–	(123)	(62)	(1,573)
Net credit-impaired	557	–	2	94	653
Cover ratio	71%	–	98%	40%	71%
Collateral ($ million)	237	–	–	96	333
Cover ratio (after collateral)	84%	–	98%	100%	86%

1 The difference to total individual impairment provision reflects provisions against forborne loans that are not included within non-performing loans as they have been performing for 180 days

Credit-impaired (stage 3) loans and advances by geographic region (unaudited)

Stage 3 loans decreased by $1.9 billion or 21 per cent compared with 1 January 2018. The largest decrease was in the ASEAN & South Asia region ($1.5 billion), primarily due to settlement and write-offs.

	31.12.18				
Amortised cost	**Greater China & North Asia $million**	**ASEAN & South Asia $million**	**Africa & Middle East $million**	**Europe & Americas $million**	**Total $million**
Gross credit-impaired	**777**	**2,730**	**2,573**	**844**	**6,924**
Credit impairment provisions	**(282)**	**(1,705)**	**(1,726)**	**(343)**	**(4,056)**
Net credit-impaired	**495**	**1,025**	**847**	**501**	**2,868**
Cover ratio	**36%**	**62%**	**67%**	**41%**	**59%**

	01.01.18				
Amortised cost	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Gross credit-impaired	806	4,248	2,657	1,067	8,778
Credit impairment provisions	(308)	(2,500)	(1,846)	(632)	(5,286)
Net credit-impaired	498	1,748	811	435	3,492
Cover ratio	38%	59%	69%	59%	60%

	31.12.17 (IAS 39)				
Amortised cost and FVTPL	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Gross non-performing	895	3,948	2,692	1,144	8,679
Individual impairment provision	(396)	(2,389)	(1,675)	(720)	(5,180)
Non-performing loans net of individual impairment provision	499	1,559	1,017	424	3,499
Portfolio impairment provision	(129)	(180)	(121)	(36)	(466)
Net non-performing loans and advances	370	1,379	896	388	3,033
Cover ratio	59%	65%	67%	66%	65%
Cover ratio (excluding portfolio impairment provision)					60%

Movement of credit-impaired (stage 3) loans and advances provisions by client segment

Credit impairment provisions as at 31 December 2018 were $4,056 million, compared with $5,286 million as at 1 January 2018, with the decrease largely due to material reductions in Corporate & Institutional Banking.

The Corporate & Institutional Banking credit impairment provisions as at 31 December 2018 decreased by 32 per cent ($1,111 million) compared with 1 January 2018 driven by write-offs and lower new provisions taken in 2018.

The following table shows the movement of credit-impaired (stage 3) provisions for each client segment:

	31.12.18				
Amortised cost	**Corporate & Institutional Banking $million**	**Retail Banking $million**	**Commercial Banking $million**	**Private Banking $million**	**Total[1] $million**
Gross credit-impaired loans at 31 December	**4,084**	**832**	**1,773**	**235**	**6,924**
Credit impairment allowances at 1 January	**3,437**	**389**	**1,369**	**91**	**5,286**
Exchange translation difference	**(188)**	**16**	**(86)**	**3**	**(255)**
Amounts written off	**(1,179)**	**(575)**	**(291)**	**–**	**(2,045)**
Discount unwind	**(39)**	**(20)**	**(16)**	**(5)**	**(80)**
New provisions charge	**189**	**12**	**218**	**3**	**422**
Repayment	**(379)**	**–**	**(136)**	**(5)**	**(520)**
Net transfers into and out of stage 3	**85**	**172**	**14**	**–**	**271**
Changes due to risk parameters	**400**	**402**	**162**	**13**	**977**
Credit impairment allowances at 31 December	**2,326**	**396**	**1,234**	**100**	**4,056**
Net credit impairment	**1,758**	**436**	**539**	**135**	**2,868**

1 Excludes credit impairment relating to loan commitments and financial guarantees

Amortised cost	31.12.17 (IAS 39) Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Total[1] $million
Gross impaired loans at 31 December	5,957	695	2,027	207	8,886
Provisions held at 1 January	3,961	262	1,602	5	5,830
Exchange translation differences	55	15	31	1	102
Amounts written off	(1,139)	(577)	(444)	–	(2,160)
Releases of acquisition fair values	(1)	–	–	–	(1)
Recoveries of amounts previously written off	27	153	22	32	234
Discount unwind	(41)	(23)	(19)	–	(83)
Transfer to assets held for sale	–	(6)	–	–	(6)
New provisions	1,197	669	327	63	2,256
Recoveries/provisions no longer required	(314)	(218)	(86)	(34)	(652)
Net individual impairment charge against profit	883	451	241	29	1,604
Other movements[2]	(277)	–	(2)	–	(279)
Individual impairment provisions held at 31 December	3,468	275	1,431	67	5,241
Net individually impaired loans	2,489	420	596	140	3,645

1 Excludes credit impairment relating to loan commitments and financial guarantees

2 Other movements include provisions for liabilities and charges that have been drawn down and are now part of loan impairment

Credit risk mitigation

Potential credit losses from any given account, customer or portfolio are mitigated using a range of tools such as collateral, netting arrangements, credit insurance and credit derivatives, taking into account expected volatility and guarantees.

The reliance that can be placed on these mitigants is carefully assessed in light of issues such as legal certainty and enforceability, market valuation correlation and counterparty risk of the guarantor.

Collateral

The requirement for collateral is not a substitute for the ability to pay, which is the primary consideration for any lending decisions.

The unadjusted market value of collateral across all asset types, in respect of Corporate & Institutional Banking and Commercial Banking, without adjusting for over-collateralisation, was $265 billion (2017: $247 billion).

The collateral values in the table below are adjusted where appropriate in accordance with our risk mitigation policy and for the effect of over-collateralisation. Following the adoption of IFRS 9 on 1 January 2018, the extent of over-collateralisation has been determined with reference to both the drawn and undrawn components of exposure as this best reflects the effect of collateral and other credit enhancements on the amounts arising from expected credit losses. The 2017 comparatives have not been restated, as the effect of collateral on IAS 39 impairment provisions was based on the drawn component only.

We have remained prudent in the way we assess the value of collateral, which is calibrated for a severe downturn and backtested against our prior experience. On average, across all types of non-cash collateral, the value ascribed is approximately half of its current market value. Collateral held against Corporate & Institutional Banking and Commercial Banking exposures amounted to $23 billion.

In the Retail Banking and Private Banking segments, a secured loan is one where the borrower pledges an asset as collateral of which the Group is able to take possession in the event that the borrower defaults. The collateral level for Retail Banking has decreased by $2 billion in 2018. This is in line with the overall movement of the secured portfolio.

For loans and advances to customers and banks (including those held at fair value through profit or loss), the table below sets out the fair value of collateral held by the Group, adjusted where appropriate in accordance with the risk mitigation policy and for the effect of over-collateralisation.

Collateral held on loans and advances

The table below details collateral held against exposures, separately disclosing stage 3 exposure and corresponding collateral.

31.12.18									
	Amount outstanding			Collateral			Net exposure		
Amortised cost	Total $million	Stage 2 financial assets $million	Credit-impaired financial assets (S3) $million	Total[3] $million	Stage 2 financial assets $million	Credit-impaired financial assets (S3) $million	Total $million	Stage 2 financial assets $million	Credit-impaired financial assets (S3) $million
Corporate & Institutional Banking[1]	166,091	10,234	1,758	15,882	1,314	802	147,622	8,920	956
Retail Banking	101,235	2,705	436	74,485	2,092	324	26,735	613	112
Commercial Banking	26,759	4,331	539	6,767	3,966	302	19,946	365	237
Private Banking	13,616	785	135	9,729	783	135	3,887	2	–
Central & other items	10,270	26	–	6,278	–	–	3,992	26	–
Total[2]	317,971	18,081	2,868	113,141	8,155	1,563	202,182	9,926	1,305

1 Includes loans and advances to banks

2 Excludes FVTPL

3 Excludes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn and undrawn components of exposures

31.12.17 (IAS 39)									
	Maximum exposure			Collateral			Net exposure		
Amortised cost and FVTPL	Total $million	Past due but not individually impaired loans $million	Individually impaired loans $million	Total[2] $million	Past due but not individually impaired loans $million	Individually impaired loans $million	Total $million	Past due but not individually impaired loans $million	Individually impaired loans $million
Corporate & Institutional Banking[1]	193,442	1,455	5,957	70,499	160	1,111	122,943	1,295	4,846
Retail Banking	103,371	2,114	695	76,543	1,514	218	26,828	600	477
Commercial Banking	29,602	483	2,027	6,570	247	277	23,032	236	1,750
Private Banking	13,359	85	207	9,296	82	203	4,063	3	4
Central & other items	27,570	2	–	5,339	–	–	22,231	2	–
Total	367,344	4,139	8,886	168,247	2,003	1,809	199,097	2,136	7,077

1 Includes loans and advances to banks

2 Includes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn component of exposures

Collateral – Corporate & Institutional Banking and Commercial Banking

Collateral held against Corporate & Institutional Banking and Commercial Banking exposures amounted to $23 billion. Following the adoption of IFRS 9, on 1 January 2018 $44.6 billion of reverse repurchase loans, with associated collateral, was classified and measured at fair value through profit and loss. 2017 comparatives have not been restated.

Collateral taken for longer-term and sub-investment grade corporate loans continues to be high at 51 per cent.

Our underwriting standards encourage taking specific charges on assets and we consistently seek high-quality, investment grade collateral. 83 per cent of tangible collateral held comprises physical assets or is property based, with the remainder largely in cash and investment securities.

Non-tangible collateral such as guarantees and standby letters of credit is also held against corporate exposures, although the financial effect of this type of collateral is less significant in terms of recoveries. However, this type of collateral is considered when determining probability of default and other credit-related factors. Collateral is also held against off-balance sheet exposures, including undrawn commitments and trade-related instruments.

The following table provides an analysis of the types of collateral held against Corporate & Institutional Banking and Commercial Banking loan exposures.

Corporate & Institutional Banking

Amortised cost	31.12.18[1] $million	31.12.17[2] (IAS 39) $million
Maximum exposure	**166,091**	193,442
Property	**5,557**	7,014
Plant, machinery and other stock	**1,067**	3,612
Cash	**2,019**	5,742
Reverse repos	**528**	49,736
AAA	**–**	1,027
A- to AA+	**321**	40,421
BBB- to BBB+	**207**	6,448
Lower than BBB-	**–**	915
Unrated	**–**	925
Financial guarantees and insurance[3]	**3,697**	–
Commodities	**90**	162
Ships and aircraft	**2,924**	4,233
Total value of collateral	**15,882**	70,499
Net exposure	**150,209**	122,943

1 Excludes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn and undrawn components of exposures

2 Includes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn component of exposures

3 Included in 2018 as it is taken into account when determining expected credit losses

Commercial Banking

Amortised cost	31.12.18[1] $million	31.12.17[2] (IAS 39) $million
Maximum exposure	**26,759**	29,602
Property	**4,557**	4,642
Plant, machinery and other stock	**992**	767
Cash	**486**	923
Reverse repos	**72**	–
A- to AA+	**1**	–
BBB- to BBB+	**71**	–
Financial guarantees and insurance[3]	**502**	–
Commodities	**11**	4
Ships and aircraft	**147**	234
Total value of collateral	**6,767**	6,570
Net exposure	**19,992**	23,032

1 Excludes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn and undrawn components of exposures

2 Includes collateral held against FVTPL exposures, and is adjusted for over-collateralisation based on the drawn component of exposures

3 Included in 2018 as it is taken into account when determining expected credit losses

Collateral – Retail Banking and Private Banking

In Retail Banking and Private Banking, 84 per cent of the portfolio is fully secured. The proportion of unsecured loans remains broadly stable at 15 per cent and the remaining 1 per cent is partially secured.

The following table presents an analysis of loans to individuals by product; split between fully secured, partially secured and unsecured:

Amortised cost	31.12.18 Fully secured $million	31.12.18 Partially secured $million	31.12.18 Unsecured $million	31.12.18 Total[1] $million	31.12.17 (IAS 39) Fully secured $million	31.12.17 (IAS 39) Partially secured $million	31.12.17 (IAS 39) Unsecured $million	31.12.17 (IAS 39) Total[2] $million
Maximum exposure	**96,534**	**1,383**	**16,934**	**114,851**	97,523	1,301	17,750	116,574
Loans to individuals								
Mortgages	**75,386**	**191**	**23**	**75,600**	78,755	23	–	78,778
CCPL	**168**	**102**	**16,692**	**16,962**	240	86	17,209	17,535
Auto	**671**	**–**	**2**	**673**	630	–	3	633
Secured wealth products	**17,721**	**107**	**172**	**18,000**	13,903	156	95	14,154
Other	**2,588**	**983**	**45**	**3,616**	3,995	1,036	443	5,474
Total collateral[3]				**84,214**				85,839
Net exposure				**30,637**				30,735
Percentage of total loans	**84%**	**1%**	**15%**		84%	1%	15%	

1 Amounts net of ECL / individual impairment provisions and excludes FVTPL

2 Includes FVTPL

3 Collateral values are adjusted where appropriate in accordance with our risk mitigation policy and for the effect of over-collateralisation

Mortgage loan-to-value ratios by geography

Loan-to-value (LTV) ratios measure the ratio of the current mortgage outstanding to the current fair value of the properties on which they are secured.

In Mortgages, the value of property held as security significantly exceeds the value of mortgage loans. The average LTV of the overall mortgage portfolio is low at 45 per cent. Hong Kong, which represents 37 per cent of the Retail Banking mortgage portfolio has an average LTV of 39.2 per cent. All of our other key markets continue to have low portfolio LTVs, (Korea, Singapore and Taiwan at 43.5 per cent, 54.7 per cent and 51.6 per cent respectively).

An analysis of LTV ratios by geography for the mortgage portfolio is presented in the mortgage LTV ratios by geography table below.

Amortised cost	31.12.18 Greater China & North Asia %	ASEAN & South Asia %	Africa & Middle East %	Europe & Americas %	Total %
Less than 50 per cent	**67.7**	**41.5**	**20.9**	**19.6**	**58.5**
50 per cent to 59 per cent	**14.9**	**18.8**	**15.3**	**21.0**	**16.0**
60 per cent to 69 per cent	**10.7**	**22.0**	**21.8**	**30.2**	**14.4**
70 per cent to 79 per cent	**5.0**	**16.0**	**21.6**	**26.8**	**8.8**
80 per cent to 89 per cent	**1.3**	**1.5**	**12.0**	**2.4**	**1.7**
90 per cent to 99 per cent	**0.3**	**0.1**	**4.7**	**–**	**0.3**
100 per cent and greater	**0.1**	**0.1**	**3.8**	**–**	**0.2**
Average portfolio loan-to-value	**42.0**	**51.5**	**65.2**	**54.2**	**44.8**
Loans to individuals – mortgages ($ million)	**52,434**	**19,156**	**2,126**	**1,884**	**75,600**

Amortised cost	31.12.17 (IAS 39) Greater China & North Asia %	ASEAN & South Asia %	Africa & Middle East %	Europe & Americas %	Total %
Less than 50 per cent	62.9	36.1	21.6	28.4	54.7
50 per cent to 59 per cent	16.4	17.5	16.9	23.4	16.8
60 per cent to 69 per cent	15.3	18.7	22.6	31.4	16.6
70 per cent to 79 per cent	4.5	22.8	20.8	13.7	9.5
80 per cent to 89 per cent	0.7	4.3	11.2	2.0	1.9
90 per cent to 99 per cent	0.1	0.3	3.9	0.4	0.3
100 per cent and greater	0.1	0.3	3.0	0.8	0.2
Average portfolio loan-to-value	43.5	55.0	63.9	52.1	46.8
Loans to individuals – mortgages ($ million)	54,609	20,105	2,279	1,785	78,778

Collateral and other credit enhancements possessed or called upon

The Group obtains assets by taking possession of collateral or calling upon other credit enhancements (such as guarantees). Repossessed properties are sold in an orderly fashion. Where the proceeds are in excess of the outstanding loan balance the excess is returned to the borrower. Certain equity securities acquired may be held by the Group for investment purposes and are classified as fair value through other comprehensive income, and the related loan written off.

The carrying value of collateral possessed and held by the Group as at 31 December 2018 is $18.2 million (2017: $24.1 million).

The decrease in collateral value is largely due to the reduction in cash collateral following utilisation to settle customer outstanding.

	2018 $million	2017 $million
Property, plant and equipment	**8.7**	14.9
Equity shares	**–**	0.2
Guarantees	**8.6**	4.0
Cash	**0.6**	4.6
Other	**0.3**	0.4
Total	**18.2**	24.1

Other credit risk mitigation

Other forms of credit risk mitigation are set out below.

Credit default swaps

The Group has entered into credit default swaps for portfolio management purposes, referencing loan assets with a notional value of $21 billion (2017: $16 billion). These credit default swaps are accounted for as financial guarantees as per IFRS 9. The Group continues to hold the underlying assets referenced in the credit default swaps and it continues to be exposed to related credit and foreign exchange risk on these assets.

Derivative financial instruments

The Group enters into master netting agreements, which in the event of default result in a single amount owed by or to the counterparty through netting the sum of the positive and negative mark-to-market values of applicable derivative transactions. These are set out in more detail under Derivative financial instruments credit risk mitigation (page 184).

Off-balance sheet exposures

For certain types of exposures, such as letters of credit and guarantees, the Group obtains collateral such as cash depending on internal credit risk assessments, as well as in the case of letters of credit holding legal title to the underlying assets should a default take place.

Other portfolio analysis

This section provides maturity analysis by business segment and industry and Retail Products analysis by region.

Maturity analysis of loans and advances by client segment

The loans and advances to the Corporate & Institutional Banking and Commercial Banking segments remain predominantly short-term, with 60 per cent of loans and advances to customers in the segments maturing in less than one year, a decrease compared with December 2017, and 96 per cent of loans to banks maturing in less than one year. Shorter maturity gives us the flexibility to respond promptly to events and rebalance or reduce our exposure to clients or sectors that are facing increased pressure or uncertainty.

The Private Banking loan book also demonstrates a short-term bias, typical for loans that are secured on wealth management assets.

The Retail Banking loan book continues to be longer-term in nature with 70 per cent of the loans maturing over five years as mortgages constitute the majority of this portfolio.

Amortised cost	31.12.18 One year or less $million	One to five years $million	Over five years $million	Total $million
Corporate & Institutional Banking	**60,794**	**36,164**	**10,330**	**107,288**
Retail Banking	**16,372**	**14,091**	**71,600**	**102,063**
Commercial Banking	**21,085**	**5,660**	**1,364**	**28,109**
Private Banking	**12,710**	**396**	**618**	**13,724**
Central & other items	**10,265**	**7**	**–**	**10,272**
Gross loans and advances to customers	**121,226**	**56,318**	**83,912**	**261,456**
Impairment provisions	**(4,329)**	**(294)**	**(276)**	**(4,899)**
Net loans and advances to customers	**116,897**	**56,024**	**83,636**	**256,557**
Net loans and advances to banks	**58,784**	**2,597**	**33**	**61,414**

Amortised cost and FVTPL	31.12.17 (IAS 39) One year or less $million	One to five years $million	Over five years $million	Total $million
Corporate & Institutional Banking	90,613	31,827	9,454	131,894
Retail Banking	24,200	17,341	61,680	103,221
Commercial Banking	21,683	5,293	1,231	28,207
Private Banking	12,407	270	676	13,353
Central & other items	9,335	6	2	9,343
Net of individual impairment provisions	158,238	54,737	73,043	286,018
Portfolio impairment provision				(465)
Net carrying value (customers)				285,553
Net carrying value (banks)	77,739	2,974	612	81,325

Industry and Retail Products analysis of loans and advances by geographic region (unaudited)

This section provides an analysis of the Group's amortised cost loan portfolio, net of provisions, by industry and region.

In the Corporate & Institutional Banking and Commercial Banking segments our largest industry exposure is manufacturing, which constitutes 17 per cent of Corporate & Institutional Banking and Commercial Banking loans and advances to customers (1 January 2018: 16 per cent). The manufacturing sector group is spread across a diverse range of industries, including automobiles and components, capital goods, pharmaceuticals, biotech and life sciences, technology hardware and equipment, chemicals, paper products and packaging, with lending spread over 4,639 clients.

The financing, insurance and non-banking industry group constitutes 15 per cent of Corporate & Institutional Banking and Commercial Banking loans and advances to customers. Clients are mostly investment grade institutions and this lending forms part of the liquidity management of the Group.

Loans and advances to the energy sector have dropped by 1 per cent to 12 per cent of total loans and advances to Corporate & Institutional Banking and Commercial Banking (1 January 2018: 13 per cent). The energy sector lending is spread across five subsectors and over 438 clients.

The Group provides loans to commercial real estate counterparties of $15 billion, which represents 6 per cent of total customer loans and advances. In total, $8.8 billion of this lending is to counterparties where the source of repayment is substantially derived from rental or sale of real estate and is secured by real estate collateral. The remaining commercial real estate loans comprise working capital loans to real estate corporates, loans with non-property collateral, unsecured loans and loans to real estate entities of diversified conglomerates. The average LTV ratio of the commercial real estate portfolio has increased to 43 per cent, compared with 41 per cent in 2017. The proportion of loans with an LTV greater than 80 per cent has remained at 1 per cent during the same period.

The mortgage portfolio continues to be the largest portion of the Retail Products portfolio, at 66 per cent. CCPL and other unsecured lending remain broadly stable at 15 per cent of total Retail Products loans and advances.

Industry and Retail products analysis by geographic region

Amortised cost	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
	31.12.18				
Industry:					
Energy	2,778	5,279	2,793	6,150	17,000
Manufacturing	10,531	6,298	3,209	3,601	23,639
Financing, insurance and non-banking	8,657	4,653	915	6,662	20,887
Transport, telecom and utilities	5,712	4,177	4,703	1,178	15,770
Food and household products	1,945	4,011	2,798	975	9,729
Commercial real estate	8,148	4,865	1,854	168	15,035
Mining and quarrying	1,683	2,283	1,088	932	5,986
Consumer durables	4,892	2,255	731	524	8,402
Construction	831	1,094	1,225	152	3,302
Trading companies and distributors	1,976	624	391	16	3,007
Government	1,726	8,815	3,113	83	13,737
Other	1,686	1,899	803	824	5,212
Retail Products:					
Mortgages	52,434	19,156	2,126	1,884	75,600
CCPL and other unsecured lending	10,269	4,234	2,459	–	16,962
Auto	–	522	150	1	673
Secured wealth products	6,912	9,055	310	1,723	18,000
Other	2,616	320	679	1	3,616
Net loans and advances to customers	**122,796**	**79,540**	**29,347**	**24,874**	**256,557**
Net loans and advances to banks	**27,858**	**11,676**	**5,573**	**16,307**	**61,414**

Amortised cost	Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
	01.01.18				
Industry:					
Energy	2,841	5,874	3,188	6,262	18,165
Manufacturing	10,885	6,290	3,145	1,883	22,203
Financing, insurance and non-banking	7,096	4,996	1,242	6,480	19,814
Transport, telecom and utilities	6,396	3,870	4,508	995	15,769
Food and household products	2,173	4,100	2,485	1,168	9,926
Commercial real estate	8,047	5,084	1,472	52	14,655
Mining and quarrying	1,878	2,857	1,033	580	6,348
Consumer durables	4,214	2,536	975	691	8,416
Construction	987	1,097	1,275	238	3,597
Trading companies and distributors	1,153	573	426	128	2,280
Government	1,669	6,585	1,184	164	9,602
Other	1,831	1,884	1,069	579	5,363
Retail Products:					
Mortgages	54,602	20,099	2,273	1,783	78,757
CCPL and other unsecured lending	9,585	3,935	2,893	2	16,415
Auto	–	399	230	–	629
Secured wealth products	5,268	6,973	212	1,657	14,110
Other	2,349	2,409	696	4	5,458
Net carrying value (customers)	120,974	79,561	28,306	22,666	251,507
Net carrying value (banks)	30,002	12,408	4,595	15,290	62,295

Amortised cost and FVTPL	31.12.17 (IAS 39) Greater China & North Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Industry:					
Energy	2,855	6,097	3,303	6,289	18,544
Manufacturing	10,919	6,685	3,221	1,906	22,731
Financing, insurance and non-banking	8,213	6,421	1,308	29,042	44,984
Transport, telecom and utilities	6,456	3,965	4,707	1,036	16,164
Food and household products	2,174	4,126	2,577	1,179	10,056
Commercial real estate	8,429	5,169	1,479	62	15,139
Mining and quarrying	2,079	2,903	1,089	570	6,641
Consumer durables	4,432	2,544	1,300	790	9,066
Construction	989	1,118	1,358	238	3,703
Trading companies & distributors	1,192	573	432	128	2,325
Government	4,864	6,728	1,430	1,398	14,420
Other	1,839	2,174	1,075	583	5,671
Retail Products:					
Mortgages	54,609	20,105	2,279	1,785	78,778
CCPL and other unsecured lending	10,175	4,336	3,022	2	17,535
Auto	–	399	234	–	633
Secured wealth products	5,278	7,005	213	1,658	14,154
Other	2,365	2,410	696	3	5,474
	126,868	82,758	29,723	46,669	286,018
Portfolio impairment provision	(129)	(179)	(121)	(36)	(465)
Net carrying value (customers)	126,739	82,579	29,602	46,633	285,553
Net carrying value (banks)	33,226	16,523	7,428	24,148	81,325

Debt securities and other eligible bills

This section provides further detail on gross debt securities and treasury bills and asset-backed securities.

Amortised cost and FVOCI	**31.12.18 Debt securities and other eligible bills $million**	01.01.18 Debt securities and other eligible bills $million
12-month expected credit losses (stage 1)	**118,713**	107,308
AAA	**55,205**	30,759
AA- to AA+	**35,685**	48,206
A- to A+	**13,803**	11,016
BBB- to BBB+	**9,639**	9,431
Lower than BBB-	**30**	257
Unrated	**4,351**	7,639
Lifetime expected credit losses (stage 2)	**6,909**	8,302
AAA	**156**	71
AA- to AA+	**115**	416
A- to A+	**54**	242
BBB- to BBB+	**5,486**	4,838
Lower than BBB-	**292**	403
Unrated	**806**	2,332
Credit-impaired financial assets (stage 3)	**232**	221
Lower than BBB-	**–**	–
Unrated	**232**	221
Gross balance[1]	**125,854**	115,831

1 Excludes fair value through profit or loss

Amortised cost and FVTPL	31.12.17 (IAS 39) Debt securities and other eligible bills $million
Net impaired securities:	45
Impaired securities	421
Impairment	(376)
Securities neither past due nor impaired:	135,797
AAA	35,937
AA- to AA+	51,914
A- to A+	13,305
BBB- to BBB+	17,498
Lower than BBB-	5,333
Unrated	11,810
Net carrying value	135,842

The standard credit ratings used by the Group are those used by Standard & Poor's or its equivalent. Debt securities held that have a short-term rating are reported against the long-term rating of the issuer. For securities that are unrated, the Group applies an internal credit rating, as described under the credit rating and measurement section (page 199).

Debt securities in the AAA rating category increased during the year by $24.5 billion to $55.2 billion. In line with the balance sheet growth, the Group strengthened its portfolio of liquid assets by holding more highly rated securities mainly issued by the US and UK governments. The increase in holdings of debt securities rated A- to A+ under stage 1 is mainly due to China sovereign rating downgrade from AA- to A+ by Standard & Poor's. Stage 1 unrated debt securities have reduced by $3.3 billion mainly due to securities reported as unrated in prior years having now been given a rating or maturing in 2018.

Movement in net carrying value of debt securities and other eligible bills

Amortised cost and FVOCI	31.12.18 Net carrying value $million	31.12.17 (IAS 39) Net carrying value $million
As at 1 January 2018	**115,534**	107,584
Exchange translation differences and other movements	**(2,794)**	3,463
Additions	**276,394**	265,126
Maturities and disposals	**(263,996)**	(260,271)
Transfers to assets held for sale	**–**	(60)
Impairment, net of recoveries on disposal	**(7)**	(20)
Changes in fair value (including the effect of fair value hedging)	**84**	17
Amortisation of discounts and premiums	**375**	292
As at 31 December 2018	**125,590**	116,131

Asset-backed securities (unaudited)

	31.12.18				01.01.18			
	Percentage of notional value of portfolio $million	Notional $million	Carrying value $million	Fair value[1] $million	Percentage of notional value of portfolio $million	Notional $million	Carrying value $million	Fair value[1] $million
Residential mortgage-backed securities (RMBS)[2]	59%	4,369	4,369	4,356	44%	2,814	2,812	2,812
Collateralised debt obligations (CDOs)	2%	155	150	150	1%	75	70	69
Commercial mortgage-backed securities (CMBS)	1%	94	94	94	1%	63	29	29
Other asset-backed securities (other ABS)[3]	38%	2,855	2,849	2,846	54%	3,518	3,517	3,519
	100%	7,473	7,462	7,446	100%	6,470	6,428	6,429
Of which:								
Financial assets held at fair value through profit or loss	11%	823	816	819	14%	887	885	890
Financial assets held at non trading mandatorily fair value through profit or loss	4%	282	278	278	7%	453	410	410
Financial assets held at amortised cost	34%	2,559	2,556	2,556	17%	1,078	1,079	1,072
Investment securities – FVOCI	51%	3,809	3,812	3,793	63%	4,052	4,054	4,057
	100%	7,473	7,462	7,446	100%	6,470	6,428	6,429

1 Fair value reflects the value of the entire portfolio, including assets redesignated to loans at amortised cost

2 RMBS includes Other UK, Dutch, Australia and Korea RMBS

3 Other asset-backed securities includes auto loans, credit cards, student loans, future flows and trade receivables

The carrying value of asset-backed securities (ABS) represents 1 per cent (2017: 1 per cent) of the Group's total assets.

The credit quality of the ABS portfolio remains strong, with over 99 per cent of the overall portfolio rated investment grade, and 71 per cent of the overall portfolio rated as AAA. Residential mortgage-backed securities (RMBS) make up 59 per cent of the overall portfolio and have a weighted averaged credit rating of AAA (AAA in 2017).

Other ABS includes auto ABS, comprising 22 per cent of the overall portfolio, and credit card ABS (3 per cent). Both maintain a weighted average credit rating of AAA. The balance of Other ABS mainly includes securities backed by consumer loans, CLOs, CMBS, diversified payment rights and receivables ABS.

IFRS 9 methodology

Approach for determining expected credit losses

Credit loss terminology

Component	Definition
Probability of default (PD)	The probability that a counterparty will default, over the next 12 months from the reporting date (stage 1) or over the lifetime of the product (stage 2) and incorporating the impact of forward-looking economic assumptions that have an effect on credit risk, such as interest rates, unemployment rates and GDP forecasts. The PD estimates will fluctuate in line with the economic cycle. The lifetime (or term structure) PDs are based on statistical models, calibrated using historical data and adjusted to incorporate forward-looking economic assumptions.
Loss given default (LGD)	The loss that is expected to arise on default, incorporating the impact of forward-looking economic assumptions where relevant, which represents the difference between the contractual cash flows due and those that the bank expects to receive. The Group estimates LGD based on the history of recovery rates and considers the recovery of any collateral that is integral to the financial asset, taking into account forward-looking economic assumptions where relevant.
Exposure at default (EAD)	The expected balance sheet exposure at the time of default, taking into account the expected change in exposure over the lifetime of the exposure. This incorporates the impact of drawdowns of committed facilities, repayments of principal and interest, amortisation and prepayments, together with the impact of forward-looking economic assumptions where relevant.

To determine the expected credit loss, these components are multiplied together (PD for the reference period (up to 12 months or lifetime) x LGD at the beginning of the period x EAD at the beginning of the period) and discounted to the balance sheet date using the effective interest rate as the discount rate.

Although the IFRS 9 models leverage the existing Basel advanced IRB risk components, several significant adjustments are required to ensure the resulting outcome is in line with the IFRS 9 requirements.

Key differences between regulatory and IFRS expected credit loss models

	Basel advanced IRB expected loss	IFRS 9 Expected credit loss
Rating philosophy	Point-in-time, through-the-cycle or hybrid, depending on the relevant regulatory requirements	Point-in-time
Parameters calibration	Often conservative, due to regulatory floors and downturn calibration	Unbiased estimate, based on conditions known at the balance sheet date
– PD		Inclusion of forward-looking information and removal of conservatism and bias
– LGD		Removal of regulatory floors, exclusion of non-direct costs
– EAD	Floored at outstanding amount	Recognises ability to have a reduction in exposure from the balance sheet date to the default date
Timeframe	12-month period	Up to 12 months and lifetime
Discounting applied	Discounting at the weighted average cost of capital to the time of default	Discounting at the effective interest rate (EIR) to the balance sheet reporting date

IFRS 9 expected credit loss models have been developed for the Corporate & Institutional Banking and Commercial Banking businesses on a global basis, in line with their respective portfolios. However, for some of the most material countries, country-specific models have also been developed.

The calibration of forward-looking information is assessed at a country or region level to take into account local macroeconomic conditions.

Retail Banking expected credit loss models are country and product specific given the local nature of the Retail Banking business.

For less material Retail Banking loan portfolios, the Group has adopted simplified approaches based on historical roll rates or loss rates:

- For medium-sized Retail Banking portfolios, a roll rate model is applied, which uses a matrix that gives average loan migration rate from delinquency states from period to period. A matrix multiplication is then performed to generate the final PDs by delinquency bucket over different time horizons
- For smaller Retail Banking portfolios, loss rate models are applied. These use an adjusted gross charge-off rate, developed using monthly write-off and recoveries over the preceding 12 months and total outstanding balances

For a limited number of exposures, proxy parameters or approaches are used where the data is not available to calculate the origination PDs and a proxy approach is taken to apply the SICR criteria; or for some retail portfolios where a full history of LGD data is not available and estimates based on the loss experience from similar portfolios are used. The use of proxies is monitored and will reduce over time.

Application of lifetime

Expected credit loss is estimated based on the shorter of the expected life and the maximum contractual period for which the Group is exposed to credit risk. For Retail Banking credit cards and Corporate & Institutional Banking overdraft facilities, however, the Group does not typically enforce the contractual period. As a result, for these instruments, the lifetime of the exposure is based on the period the Group is exposed to credit risk. This period has been determined by reference to expected behavioural life of the exposure and the extent to which credit risk management actions curtail the period of exposure. For credit cards, this has resulted in an average life of between 3 and 10 years across our footprint markets. Overdraft facilities have a 22-month lifetime.

Key assumptions and judgements in determining expected credit loss

Incorporation of forward-looking information

The evolving economic environment is a key determinant of the ability of a bank's clients to meet their obligations as they fall due. It is a fundamental principle of IFRS 9 that the provisions banks hold against potential future credit risk losses should depend not just on the health of the economy today, but should also take into account potential changes to the economic environment. For example, if a bank were to anticipate a sharp slowdown in the world economy over the coming year, it should hold more provisions today to absorb the credit losses likely to occur in the near future.

To capture the effect of changes to the economic environment, the PDs and LGDs used to calculate expected credit loss, incorporate forward-looking information in the form of forecasts of the values of economic variables and asset prices that are likely to have an effect on the repayment ability of the Group's clients.

The 'Base Forecast' of the economic variables and asset prices is based on management's view, supported by projections from the Group's in-house research team and outputs from models that project specific economic variables and asset prices.

Forecast of key macroeconomic variables underlying the expected credit loss calculation and the impact on non-linearity

The Base Forecast – management's view of the most likely outcome – is that the synchronised expansion of the global economy will continue over the coming years alongside a normalisation of monetary policy in the developed world and the successful rebalancing of the Chinese economy, with US–China trade tensions putting China's export sectors under some pressure.

While this Base Forecast is the premise for the Group's strategic plan, one of the key requirements of IFRS 9 is that the assessment of provisions should be based on a range of potential outcomes for the future economic environment. For example, the global economy may grow more quickly or more slowly than the Base Forecast, and these variations would have different implications for the provisions that the Group should hold today. As the negative impact of an economic downturn on credit losses tends to be greater than the positive impact of an economic upturn, if the Group sets provisions only on the expected credit loss under the Base Forecast, it might not end up with a level of provisions that appropriately considers the range of potential outcomes. To address this skewness (or non-linearity) in expected credit loss, IFRS 9 requires the ECL to be the probability-weighted amount calculated for a range of possible outcomes.

To take account of the potential non-linearity in expected credit loss, the Group simulates a set of 50 scenarios around the Base Forecast and calculates the expected credit loss under each of them. These scenarios are generated by a Monte Carlo simulation, which considers the degree of uncertainty (or volatility) around economic outcomes and how these outcomes have tended to move in relation to one another (or correlation). The use of Monte Carlo simulation is motivated by the number and spread of countries in which the Group operates. This implies that the number of countries' macroeconomic variables to forecast is large, but more importantly the observation that a downturn in one part of the world is never perfectly synchronised with downturns everywhere else means that the Group may be challenged to capture a full range of scenarios with a handful of manually tuned scenarios.

While the 50 scenarios do not each have a specific narrative, they reflect a range of plausible hypothetical alternative outcomes for the global economy. Some imply an unwinding of the current shocks and uncertainty leading to higher global economic activity and higher asset prices, while others represent an intensification of current shocks or introduction of new shocks that raise uncertainty, leading to lower global economic activity and lower asset prices.

The table below provides a summary of the Group's Base Forecast, alongside the corresponding range seen across the multiple scenarios.

Over the medium term – five years ahead – there has been relatively little change in the forecast level of activity relative to the start of the year. At the margin, the ongoing trade policy tensions between the US and China have reduced prospective export growth in China, particularly in the near term. The effect of the external trade shock is expected to be offset by moderate domestic policy stimulus by Chinese authorities and so average real GDP growth projections over the medium term have been revised downwards only marginally, to 6.0 per cent from 6.1 per cent. Some policy stimulus was provided during 2018, for example an easing of monetary policy by the People's Bank of China (PBoC). This policy stance is expected to persist and so the projected average three-month interbank interest rate over the medium term has been revised down materially to 3.1 per cent from 4.2 per cent.

In contrast to the Chinese economy, the US economy continued to grow above trend during 2018, prompting the Federal Reserve to raise US policy interest rates faster than expected. For those countries where the monetary policy framework is based on managing the level of the currency in reference to the US dollar – either as a currency board (Hong Kong) or as a currency basket (Singapore) – domestic interest rates rise, to some degree, with US interest rates. The revised outlook for short-term interbank interest rates is not expected to have a material effect on activity, property price inflation or unemployment in those countries over the medium term.

The most material revision in the base forecast is to the oil price. At the start of the year oil prices were expected to average around US$61/barrel over the medium term, but by the end of the year that projection had been revised up to around US$85. While current prices have been impacted by speculative movements out of oil, a number of supply and demand factors together determine the oil price. The most important driver of the rise in projected oil prices over the medium term was the decision by the US government not to renew waivers on certain sanctions on Iran, including the export of oil.

	China			Hong Kong			Korea			Singapore			India		
31.12.2018	**Base forecast**	**Low[2]**	**High[3]**	**Base forecast**	**Low[2]**	**High[3]**	**Base forecast**	**Low[2]**	**High[3]**	**Base forecast**	**Low[2]**	**High[3]**	**Base forecast**	**Low[2]**	**High[3]**
GDP growth (YoY%)	**6.0**	**4.3**	**7.7**	**3.0**	**0.6**	**5.6**	**2.9**	**0.4**	**5.3**	**2.4**	**(1.7)**	**6.4**	**7.7**	**5.6**	**10.1**
Unemployment (%)	**4.0**	**3.8**	**4.2**	**3.4**	**2.4**	**4.6**	**3.2**	**2.4**	**4.0**	**3.0**	**2.3**	**3.7**	**N/A**	**N/A**	**N/A**
3-month interest rates (%)	**3.1**	**2.0**	**4.3**	**3.0**	**1.8**	**4.2**	**2.6**	**1.4**	**4.0**	**2.4**	**1.3**	**3.8**	**6.9**	**5.1**	**8.9**
House prices (YoY%)	**5.8**	**3.4**	**8.5**	**2.3**	**(8.1)**	**12.1**	**3.5**	**1.3**	**6.1**	**4.4**	**(1.5)**	**10.6**	**8.4**	**1.4**	**15.1**

	China			Hong Kong			Korea			Singapore			India		
01.01.2018	Base forecast	Low[2]	High[3]	Base forecast	Low[2]	High[3]	Base forecast	Low[2]	High[3]	Base forecast	Low[2]	High[3]	Base forecast	Low[2]	High[3]
GDP growth (YoY%)	6.1	4.5	7.6	3.0	0.3	5.4	2.9	0.8	5.6	2.3	(2.0)	6.1	7.5	5.4	9.7
Unemployment (%)	4.0	3.8	4.2	3.6	2.4	4.8	3.3	2.5	4.6	2.8	2.2	3.5	N/A[1]	N/A[1]	N/A[1]
3-month interest rates (%)	4.2	2.9	5.6	1.7	1.0	3.7	2.3	1.4	4.3	1.7	1.2	3.9	6.2	5.3	9.0
House prices (YoY%)	5.4	3.5	8.0	2.0	(7.5)	12.3	3.5	1.4	6.0	3.8	(1.8)	9.2	8.5	1.3	15.5

31.12.2018	**Base forecast**	**Low[2]**	**High[3]**
Crude price Brent, $ pb	**85**	**40**	**118**

01.01.2018	Base forecast	Low[2]	High[3]
Crude price Brent, $ pb	61	35	92

1 Not available

2 Represents the 10th percentile in the range used to determine non-linearity

3 Represents the 90th percentile in the range used to determine non-linearity

The final expected credit loss reported by the Group is a simple average of the expected credit loss for each of the 50 scenarios. The impact of non-linearity on expected credit loss is set out in the table below:

	Including non-linearity $million	Excluding non-linearity $million	Difference %
Total expected credit loss[1]	1,163	1,139	2.1

1 Total modelled expected credit loss comprises stage 1 and stage 2 balances of $1,031 million and $132 million of modelled expected credit loss on stage 3 loans

The average expected credit loss under multiple scenarios is 2.1 per cent higher than the expected credit loss calculated using only the most likely scenario (the Base Forecast). Portfolios that are more sensitive to non-linearity include those with greater leverage and/or a longer tenor, such as Project and Shipping Finance portfolios. Other portfolios display minimal non-linearity owing to limited their responsiveness to macroeconomic impacts for structural reasons such as significant collateralisation as with the Retail Banking mortgage portfolios.

Credit-impaired assets managed by Group Special Assets Management (GSAM) incorporate forward-looking economic assumptions in respect of the recovery outcomes identified and are assigned individual probability weightings. These assumptions are not based on a Monte Carlo simulation but are informed by the Base Forecast.

Sensitivity of expected credit loss calculation to macroeconomic variables

The expected credit loss calculation relies on multiple variables and is inherently non-linear and portfolio-dependent, which implies that no single analysis can fully demonstrate the sensitivity of the expected credit loss to changes in the macroeconomic variables. The Group has conducted a series of analyses with the aim of identifying the macroeconomic variables which might have the greatest impact on overall expected credit loss. These encompassed single variable and multi-variable exercises, using simple up/down variation and extracts from actual calculation data, as well as bespoke scenario design and assessment.

The primary conclusion of these exercises is that no individual macroeconomic variable is materially influential – that is, likely to result in an impact of at least 1 per cent of the Group's expected credit loss. The Group believes this is plausible, because the number of variables used in the expected credit loss calculation is large. This does not mean that macroeconomic variables are uninfluential; rather, that the Group believes that consideration of macroeconomics should involve whole scenarios, as this aligns with the multi-variable nature of the calculation.

As the Group has two principal uncertainties related to the macroeconomic outlook, a sensitivity analysis of ECL was undertaken to explore the combined effect of these: extended trade tensions that could lead to a China slowdown with spillovers to emerging markets. In this scenario, current trade policy tensions between the US and China increase dramatically. The US targets trading partners with which it has a material trade deficit and pushes through highly protectionist measures, initiating trade tensions with Asia focused on China. Indirectly, economies reliant on global trade flows are vulnerable to the trade shock. The escalating trade tensions create uncertainty which reduces risk appetite, leading to a decline in asset prices and lower consumption and investment across developed and emerging markets. This leads to a global slowdown and a sharp fall in commodity prices. As an indication, China annual real GDP growth troughs at circa. 4 per cent, representing a marked divergence from the base forecast growth of around 6 per cent, while China exports growth dips negative for the first time since 2009. US GDP slows from a trend rate of about 2 per cent down to 1 per cent. Crude oil prices fall, and residential property indices in China and Hong Kong dip negative. To contextualise this scenario relative to the Monte Carlo generated scenarios, the China and US GDP dips approach the lowest growth boundary of the 50 scenarios in 2019, crude oil remains closer to the middle than to the bottom edge, but the China property price index falls well below the simulated lower bound over a period of years.

Applying this scenario, modelled stage 1 and 2 expected credit loss provisions would be approximately $362 million higher than the reported base case expected credit loss provision (excluding the impact of non-linearity). This includes the impact of exposures transferring to stage 2 from stage 1 but does not consider an increase in stage 3 defaults. The proportion of exposures in stage 2 would increase from 8 per cent to 10 per cent. As expected, this has an impact on our corporate exposures in China, Hong Kong and Singapore. Within Retail Banking, the Group's credit card portfolios in Hong Kong and Singapore were impacted. Note that the actual outcome of any scenario may be materially different due to, amongst other factors, the effect of management actions to mitigate potential increases in risk and changes in the underlying portfolio.

Significant increase in credit risk

Quantitative criteria

SICR is assessed by comparing the risk of default at the reporting date to the risk of default at origination. Whether a change in the risk of default is significant or not is assessed using quantitative and qualitative criteria. These quantitative significant deterioration thresholds have been separately defined for each business and where meaningful are consistently applied across business lines.

Assets are considered to have experienced SICR if they have breached both relative and absolute thresholds for the change in the average annualised lifetime probability of default over the residual term of the exposure.

The absolute measure of increase in credit risk is used to capture instances where the PDs on exposures are relatively low at initial recognition as these may increase by several multiples without representing a significant increase in credit risk. Where PDs are relatively high at initial recognition, a relative measure is more appropriate in assessing whether there is a significant increase in credit risk, as the PDs increase more quickly.

The SICR thresholds have been calibrated based on the following principles:

- Stability – The thresholds are set to achieve a stable stage 2 population at a portfolio level, trying to minimise the number of accounts moving back and forth between stage 1 and stage 2 in a short period of time
- Accuracy – The thresholds are set such that there is a materially higher propensity for stage 2 exposures to eventually default than is the case for stage 1 exposures
- Dependency from backstops – The thresholds are stringent enough such that a high proportion of accounts transfer to stage 2 due to movements in forward-looking PD rather than relying on backward-looking backstops such as arrears
- Relationship with business and product risk profiles – The thresholds reflect the relative risk differences between different products, and are aligned to business processes

For Corporate & Institutional Banking and Commercial Banking clients, the relative threshold is a 100 per cent increase in PD and the absolute change in PD is between 50 and 100 bps.

For Retail Banking clients, the relative threshold is a 100 per cent increase in PD and the absolute change in PD is between 100 and 350 bps depending on the product. Certain countries have a higher absolute threshold reflecting the lower default rate within their personal loan portfolios compared with the Group's other personal loan portfolios.

Private Banking clients are assessed qualitatively, based on a delinquency measure relating to collateral top-ups or sell-downs.

Debt securities with an internal credit rating mapped to an investment grade equivalent are allocated to stage 1 and all other debt securities to stage 2.

Qualitative criteria

Qualitative factors that indicate that there has been a significant increase in credit risk include processes linked to current risk management, such as placing loans on non-purely precautionary early alert.

Backstop

Across all portfolios, accounts that are 30 or more days past due (DPD) on contractual payments of principal and/or interest that have not been captured by the criteria above are considered to have experienced a significant increase in credit risk.

Expert credit judgement may be applied in assessing significant increase in credit risk to the extent that certain risks may not have been captured by the models or through the above criteria. Such instances are expected to be rare, for example due to events arising close to the reporting date.

Corporate & Institutional Banking and Commercial Banking clients

Quantitative criteria

Exposures are assessed based on both the absolute and the relative movement in the PD from origination to the reporting date as described above.

To account for the fact that the mapping between internal credit grades (used in the origination process) and PDs is non-linear (e.g. a one-notch downgrade in the investment grade universe results in a much smaller PD increase than in the sub-investment grade universe), the absolute thresholds have been differentiated by credit quality at origination, as measured by internal credit grades being investment grade or sub-investment grade.

Qualitative criteria

All assets of clients that have been placed on early alert (for non-purely precautionary reasons) are deemed to have experienced a significant increase in credit risk.

An account is placed on non-purely precautionary early alert if it exhibits risk or potential weaknesses of a material nature requiring closer monitoring, supervision or attention by management. Weaknesses in such a borrower's account, if left uncorrected, could result in deterioration of repayment prospects and the likelihood of being downgraded. Indicators could include a rapid erosion of position within the industry, concerns over management's ability to manage operations, weak/deteriorating operating results, liquidity strain and overdue balances among other factors.

All client assets that have been assigned a CG12 rating, equivalent to 'higher risk', are deemed to have experienced a significant increase in credit risk. Accounts rated CG12 are managed by the GSAM unit. All Corporate & Institutional Banking and Commercial Banking clients are placed on CG12 when they are 30 DPD unless they are granted a waiver through a strict governance process.

Retail Banking clients

Quantitative criteria

Material portfolios (defined as a combination of country and product, for example Hong Kong mortgages, Taiwan credit cards), for which a statistical model has been built, are assessed based on both the absolute and relative movement in the PD from origination to the reporting date as described previously (page 177). For these portfolios, the original lifetime PD term structure is determined based on the original application score or risk segment of the client.

Qualitative criteria

Accounts that are 30 DPD that have not been captured by the quantitative criteria are considered to have experienced a significant increase in credit risk. For less material portfolios, which are modelled based on a roll rate or loss rate approach, significant increase in credit risk is primarily assessed through the 30 DPD trigger.

Private Banking clients

For Private Banking clients, significant increase in credit risk is assessed by referencing the nature and the level of collateral against which credit is extended (known as 'Classes of risk').

Qualitative criteria

For all Private Banking classes, in line with risk management practice, an increase in credit risk is deemed to have occurred where margining or LTV covenants have been breached.

For Class I assets, if these margining requirements have not been met within 30 days of a trigger, a significant increase in credit risk is assumed to have occurred.

For Class I and Class III assets, a significant increase in credit risk is assumed to have occurred where the bank is unable to 'sell down' the applicable assets to meet revised collateral requirements within five days of a trigger.

Class II assets are typically unsecured or partially secured, or secured against illiquid collateral such as shares in private companies. Significant credit deterioration of these assets is deemed to have occurred when any early alert trigger has been breached.

Debt securities

Quantitative criteria

The bank is utilising the low credit risk simplified approach. All debt securities with an internal credit rating mapped to an investment grade equivalent are allocated to stage 1 and all other debt securities are allocated to stage 2.

Qualitative criteria

Debt securities utilise the same qualitative criteria as the Corporate & Institutional Banking and Commercial Banking client segments, including being placed on early alert or being classified as CG12.

Assessment of credit-impaired financial assets

Retail Banking clients

The core components in determining credit-impaired expected credit loss provisions are the value of gross charge-off and recoveries. Gross charge-off and/or loss provisions are recognised when it is established that the account is unlikely to pay through the normal process. Recovery of unsecured debt post credit impairment is recognised based on actual cash collected, either directly from clients or through the sale of defaulted loans to third-party institutions. Release of credit impairment provisions for secured loans is recognised if the loan outstanding is paid in full (release of full provision), or the provision is higher than the loan outstanding (release of the excess provision).

Corporate & Institutional Banking, Commercial Banking and Private Banking clients

Credit-impaired accounts are managed by the Group's specialist recovery unit, Group Special Assets Management (GSAM), which is independent from its main businesses. Where any amount is considered irrecoverable, a stage 3 credit impairment provision is raised. This stage 3 provision is the difference between the loan-carrying amount and the probability-weighted present value of estimated future cash flows, reflecting a range of scenarios (typically the best, worst and most likely recovery outcomes). Where the cash flows include realisable collateral, the values used will incorporate the impact of forward-looking economic information.

The individual circumstances of each client are considered when GSAM estimates future cash flows and timing of future recoveries which involve significant judgement. All available sources, such as cash flow arising from operations, selling assets or subsidiaries, realising collateral or payments under guarantees, are considered. In any decision relating to the raising of provisions, the Group attempts to balance economic conditions, local knowledge and experience, and the results of independent asset reviews.

Write-offs

Where it is considered that there is no realistic prospect of recovering a portion of an exposure against which an impairment provision has been raised, that amount will be written off.

Governance and application of expert credit judgement in respect of expected credit losses

The models used in determining expected credit losses are reviewed and approved by the Group Credit Model Assessment Committee (CMAC), which is appointed by the Model Risk Committee. The CMAC has the responsibility to assess and approve the use of models and to review all IFRS 9 interpretations related to models. The CMAC also provides oversight on operational matters related to model development, performance monitoring and model validation activities including standards, regulatory and Group Internal Audit matters.

Prior to submission to the CMAC for approval, the models have been validated by Group Model Validation (GMV), a function which is independent of the business and the model developers. GMV's analysis comprises review of model documentation, model design and methodology; data validation; review of model development and calibration process; out-of-sample performance testing; and assessment of compliance review against IFRS 9 rules and internal standards.

Key inputs into the calculation and resulting expected credit loss provisions are subject to review and approval by the IFRS 9 Impairment Committee which is appointed by the Group Risk Committee. The IFRS 9 Impairment Committee consists of senior representatives from Risk, Finance, and Group Economic Research. It meets at least twice every quarter, once before the models are run to approve key inputs into the calculation, and once after the models are run to approve the expected credit loss provisions and any judgemental override that may be necessary.

The IFRS 9 Impairment Committee:

- Oversees the appropriateness of all Business Model Assessment and Solely Payments of Principal and Interest (SPPI) tests
- Reviews and approves expected credit loss for financial assets classified as stages 1, 2 and 3 for each financial reporting period
- Reviews and approves stage allocation rules and thresholds
- Approves material adjustments in relation to expected credit loss for FVOCI and amortised cost financial assets
- Reviews, challenges and approves base macroeconomic forecasts and (the multiple macroeconomic scenarios approach) that are utilised in the forward-looking expected credit loss calculations

The IFRS 9 Impairment Committee is supported by an Expert Panel which reviews and challenges the full extended version of base case projections and multiple macroeconomic scenarios. The Expert Panel consists of members of Enterprise Risk Management (which includes the Scenario Design team), Finance, Group Economic Research and country representatives of major jurisdictions.

Country Risk (unaudited)

Country cross-border risk is the risk that the Group will be unable to obtain payment from counterparties on their contractual obligations as a result of certain actions taken by foreign governments, chiefly relating to convertibility and transferability of foreign currency.

The profile of the Group's country cross-border exposures as at 31 December 2018 remained consistent with its strategic focus on core franchise countries. Changes in the pace of economic activity and portfolio management activity had an impact on the growth of cross-border exposure for certain territories.

Country cross-border exposure to China remains predominantly short-term (85 per cent of exposure had a tenor of less than one-year). During 2018, the Group's cross-border exposure to China decreased, primarily driven by a loan portfolio reduction, as well as repayment of some large-scale term and bridge loans.

Country cross-border exposure to Hong Kong rose marginally, with strong loan book growth largely offset by a decline in trade finance exposures; reflecting a more subdued global trade environment and domestic economic headwinds.

Singapore's cross-border exposure declined during 2018 due to a reduction in exposure from corporate business loans and structured finance transactions, partially offset by an uptick in interbank exposures.

The increase in United Arab Emirates cross-border exposure reflects growth in the loan book and trade finance. Growth is supported by new exposures to Abu Dhabi government-related entities and core Dubai corporates, increased refinancing activities and bridging loans to acquisition transactions.

The decrease in cross-border exposure to South Korea reflects a reduction in marketable securities held, as well as economic and external headwinds stemming from uncertainty around the ongoing trade tensions and monetary tightening in the United States.

India's cross-border exposure declined, primarily driven by facility roll-offs on the loan book, as well as a reduction in both issuer risk and private bank exposures.

Cross-border exposure to developed countries in which the Group does not have a major presence, predominantly relates to treasury and liquidity management activities, which can change significantly from period to period. Exposure to such markets also represents global corporate business for customers with interests in our footprint. The increase in exposures to the United States, Germany and Australia are all largely attributed to Group liquidity management operations during the year.

The table below, which is based on the Group's internal country cross-border risk reporting requirements, shows cross-border exposures that exceed 1 per cent of total assets.

	31.12.18			31.12.17		
	Less than one year $million	**More than one year $million**	**Total $million**	Less than one year $million	More than one year $million	Total $million
China[1]	**37,039**	**6,458**	**43,497**	38,676	6,204	44,880
United States	**15,369**	**8,986**	**24,355**	10,068	9,524	19,592
Hong Kong[1]	**11,451**	**8,819**	**20,270**	11,686	7,964	19,650
Singapore	**12,799**	**5,921**	**18,720**	13,555	5,955	19,510
United Arab Emirates	**8,531**	**9,139**	**17,670**	7,932	8,341	16,273
South Korea	**12,210**	**4,550**	**16,760**	14,513	4,331	18,844
India	**10,536**	**5,674**	**16,210**	11,687	5,819	17,506
Germany	**3,236**	**7,080**	**10,316**	3,022	4,505	7,527
Australia	**2,495**	**5,335**	**7,830**	1,916	4,045	5,961

1 Cross-border exposures for 31.12.17 (IAS 39) relating to China and Hong Kong have been restated to reflect methodology amendments:
- China – Less than one-year bucket restated from $40,351 million to $38,676 million. Consequently the total is restated from $46,455 million to $44,880 million
- Hong Kong – More than one-year bucket restated from $7,867 million to $7,964 million. Consequently the total is restated from $19,552 million to $19,650 million

Traded risk

Traded risk is the potential for loss resulting from activities undertaken by the bank in financial markets. Under the Enterprise Risk Management Framework, the introduction of the Traded Risk Framework in 2018 sought to bring together all risk types exhibiting risk features common to traded risk.

These risk types include Market risk, Counterparty Credit risk, Issuer risk, XVA, Algorithmic trading and Pension risk. Traded Risk Management (TRM, formerly Market and Traded Credit Risk) is the core risk management function supporting market-facing businesses, specifically Financial Markets and Treasury Markets.

Market risk

Market risk is the potential for loss of economic value due to adverse changes in financial market rates or prices. The Group's exposure to market risk arises predominantly from the following sources:

- **Trading book:** the Group provides clients access to financial markets, facilitation of which entails the Group taking moderate market risk positions. All trading teams support client activity; there are no proprietary trading teams. Hence, income earned from market risk-related activities is primarily driven by the volume of client activity rather than risk-taking.
- **Non-trading book:**
  - The Treasury Markets desk is required to hold a liquid assets buffer, much of which is held in high-quality marketable debt securities
  - The Group has capital invested and related income streams denominated in currencies other than US dollars. To the extent that these are not hedged, the Group is subject to structural foreign exchange risk which is reflected in reserves

A summary of our current policies and practices regarding market risk management is provided in the Principal Risks section (page 202).

The primary categories of market risk for the Group are:

- Interest rate risk: arising from changes in yield curves, credit spreads and implied volatilities on interest rate options
- Foreign exchange rate risk: arising from changes in currency exchange rates and implied volatilities on foreign exchange options
- Commodity risk: arising from changes in commodity prices and implied volatilities on commodity options; covering energy, precious metals, base metals and agriculture
- Equity risk: arising from changes in the prices of equities, equity indices, equity baskets and implied volatilities on related options

Market risk changes

The average level of total trading and non-trading VaR in 2018 was 20 per cent lower than in 2017, but the actual level of total VaR as at year end 2018 was 14 per cent higher than in 2017. The reduction in the total average VaR was driven by the non-trading book, where the duration of the portfolio in the first half of 2018 was reduced. However, during the fourth quarter of 2018 the non-trading VaR increased, driven by both an increase in the bond inventory size in high-quality assets from Treasury Markets and reduced portfolio diversification.

For the trading book, the average level of VaR in 2018 was lower than in 2017 by 19 per cent. Trading activities have remained relatively unchanged and client-driven.

Daily value at risk (VaR at 97.5%, one day)

	31.12.18				31.12.17			
Trading and non-trading	**Average $million**	**High[1] $million**	**Low[1] $million**	**Actual[2] $million**	Average $million	High[1] $million	Low[1] $million	Actual[2] $million
Interest rate risk[3]	**19.2**	**25.9**	**16.6**	**25.9**	22.6	28.5	18.1	18.7
Foreign exchange risk	**4.4**	**8.6**	**2.5**	**7.7**	5.5	12.3	3.0	6.0
Commodity risk	**1.3**	**2.1**	**0.8**	**1.2**	1.2	2.0	0.6	1.0
Equity risk	**4.8**	**6.8**	**2.6**	**2.7**	7.7	8.4	6.4	6.7
Total[4]	**20.6**	**26.1**	**16.4**	**25.5**	25.7	32.4	20.3	22.3

	31.12.18				31.12.17			
Trading[5]	**Average $million**	**High[1] $million**	**Low[1] $million**	**Actual[2] $million**	Average $million	High[1] $million	Low[1] $million	Actual[2] $million
Interest rate risk[3]	**8.0**	**11.7**	**6.0**	**7.9**	10.1	13.1	7.7	8.5
Foreign exchange risk	**4.4**	**8.6**	**2.5**	**7.7**	5.5	12.3	3.0	6.0
Commodity risk	**1.3**	**2.1**	**0.8**	**1.2**	1.2	2.0	0.6	1.0
Equity risk	**0.1**	**0.1**	**–**	**–**	0.1	0.4	0.1	0.1
Total[4]	**9.8**	**13.8**	**7.5**	**13.6**	12.1	15.7	8.3	10.9

	31.12.18				31.12.17			
Non-trading	**Average $million**	**High[1] $million**	**Low[1] $million**	**Actual[2] $million**	Average $million	High[1] $million	Low[1] $million	Actual[2] $million
Interest rate risk[3]	**16.8**	**20.7**	**14.1**	**20.7**	19.5	23.1	14.4	14.4
Equity risk[6]	**4.7**	**6.8**	**2.6**	**2.7**	7.6	8.1	6.2	6.6
Total[4]	**17.2**	**21.3**	**15.3**	**21.3**	21.7	27.6	16.3	16.3

1 Highest and lowest VaR for each risk factor are independent and usually occur on different days

2 Actual one day VaR at year end date

3 Interest rate risk VaR includes credit spread risk arising from securities accounted as FVTPL or FVOCI

4 The total VaR shown in the tables above is not a sum of the component risks, due to offsets between them

5 Trading book for market risk is defined in accordance with the EU Capital Requirements Regulation (CRDIV/CRR) Part 3 Title I Chapter 3, which restricts the positions permitted in the trading book

6 Non-trading equity risk VaR includes only listed equities

The following table sets out how trading and non-trading VaR is distributed across the Group's products:

	31.12.18				31.12.17			
	Average $million	High[1] $million	Low[1] $million	Actual[2] $million	Average $million	High[1] $million	Low[1] $million	Actual[2] $million
Trading and non-trading	20.6	26.1	16.4	25.5	25.7	32.4	20.3	22.3
Trading[4]								
Rates	5.0	7.1	3.8	5.8	5.9	8.6	4.4	5.1
Global foreign exchange	4.4	8.6	2.5	7.7	5.5	12.3	3.0	6.0
Credit trading and capital markets	3.8	6.1	1.8	2.9	4.6	6.9	2.6	4.9
Commodities	1.3	2.1	0.8	1.2	1.2	2.0	0.6	1.0
Equities	0.1	0.1	–	–	0.1	0.4	0.1	0.1
XVA	3.1	4.1	2.3	3.5	5.5	8.3	3.0	3.0
Total[3]	9.8	13.8	7.5	13.6	12.1	15.7	8.3	10.9
Non-trading								
Treasury markets	16.8	20.7	14.1	20.7	19.5	23.1	14.4	14.4
Listed private equity	4.7	6.8	2.6	2.7	7.6	8.1	6.2	6.6
Total[3]	17.2	21.3	15.3	21.3	21.7	27.6	16.3	16.3

1 Highest and lowest VaR for each risk factor are independent and usually occur on different days

2 Actual one-day VaR at year end date

3 The total VaR shown in the tables above is not a sum of the component risks due to offsets between them

4 Trading book for market risk is defined in accordance with the EU Capital Requirements Regulation (CRDIV/CRR) Part 3 Title I Chapter 3 which restricts the positions permitted in the trading book

Risks not in VaR (unaudited)

In 2018, the main market risk not reflected in VaR was currency risk where the exchange rate is currently pegged or managed. The historical one-year VaR observation period does not reflect the future possibility of a change in the currency regime such as sudden depegging. The other material market risk not reflected in VaR was associated with basis risks where historical market price data for VaR is sometimes more limited, and therefore proxied, generating a potential basis risk. Additional capital is set aside to cover such 'risks not in VaR'. For further details on market risk capital see the Standard Chartered PLC Pillar 3 Disclosures 2018 section on market risk.

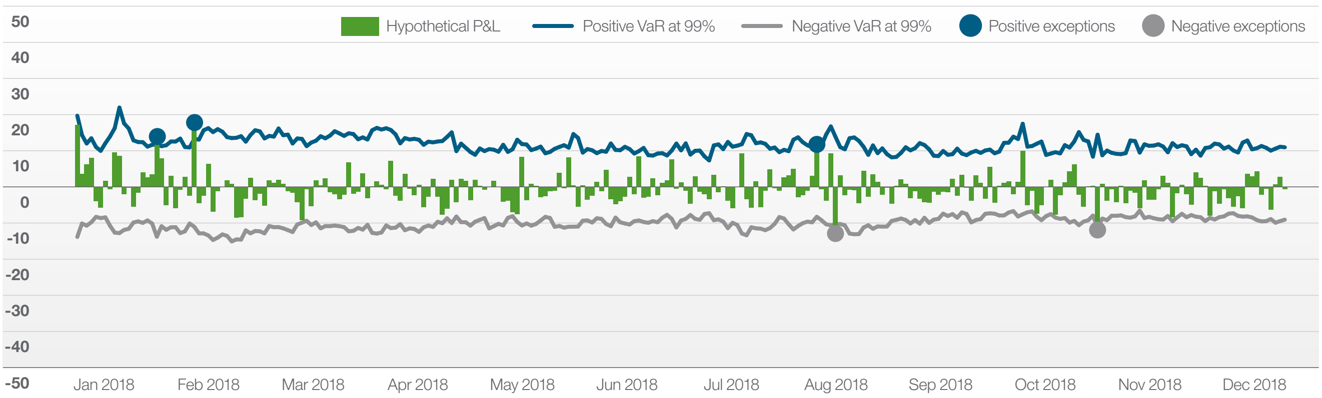
Backtesting (unaudited)

Regulatory backtesting is applied at both Group and Solo levels. In 2018, there have been two negative exceptions at Group level and three at Solo level (in 2017, there was one exception at Group level and one exception at Solo level).

Group and Solo exceptions occurred on 16 August 2018 driven by RMB which appreciated sharply due to PBoC intervention following a period of decline. Additionally, Group and Solo exceptions occurred on 2 November 2018 driven by TWD and RMB exposures when Asian currencies strengthened on talk of a draft trade deal between the US and China. On 15 November 2018 a Solo exception was driven by GBP and USD. GBP depreciated as the draft Brexit agreement ran into difficulties, and US treasury yields fell as a result of safe haven purchases. Three exceptions in a year due to market events is within the 'green zone' applied internationally to internal models by bank supervisors (Basel Committee on Banking Supervision: 'Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements', January 1996).

The graph below illustrates the performance of the VaR model used in capital calculations. It compares the 99 percentile loss confidence level given by the VaR model with the hypothetical profit and loss of each day given the actual market movement without taking into account any intra-day trading activity.

2018 Backtesting chart
Internal model approach regulatory trading book at Group level
Hypothetical profit and loss (P&L) versus VaR (99 per cent, one day)



Financial Markets loss days

	31.12.18	31.12.17
Number of loss days reported for Financial Markets trading book total product income[1]	**8**	15

1 Reflects total product income for Financial Markets:
- Including CVA and FVA risk
- Excluding Treasury Markets business (non-trading) and periodic valuation changes for Capital Markets, expected loss provisions and OIS discounting

Average daily income earned from market risk related activities[1]

Trading	31.12.18 $million	31.12.17 $million
Interest rate risk	**3.1**	3.5
Foreign exchange risk	**3.9**	3.7
Commodity risk	**0.8**	0.6
Equity risk	**–**	–
Total	**7.8**	7.8
Non-trading		
Interest rate risk	**2.4**	2.4
Equity risk	**0.4**	0.3
Total	**2.8**	2.7

1 Includes the elements of Trading income, Interest income and Other income which are generated from market risk-related activities. XVA income is included under Interest rate risk

Mapping of market risk items to the balance sheet (unaudited)

Market risk contributes 7.4 per cent of the Group's regulatory capital risk-weighted asset (RWA) requirement (refer to risk-weighted assets tables (page 221)). As highlighted in the VaR disclosure, during 2018 the majority of market risk was managed within Treasury Markets and Financial Markets, which span both the trading book and non-trading book. The non-trading equity market risk is generated by listed private equity holdings within Principal Finance. Treasury manages the market risk associated with debt and equity capital issuance.

	Amounts as per financial statements $million	Exposure to trading risk $million	Exposure to non-trading risk $million	Market risk type
Financial assets				
Derivative financial instruments	45,621	45,386	235	Interest rate, foreign exchange, commodity or equity risk
Loans and advances to banks	82,065	19,319	62,746	Interest rate or foreign exchange risk
Loans and advances to customers	299,371	42,436	256,935	Interest rate or foreign exchange risk
Debt securities and other eligible bills	147,614	22,494	125,120	Interest rate mainly, but also foreign exchange or equity risk
Equities	1,954	1,347	607	Equities risk mainly, but also interest or foreign exchange risk
Other assets	35,401	6,666	28,735	Interest rate, foreign exchange, commodity or equity risk
Total	612,026	137,648	474,378	
Financial liabilities				
Deposits by banks	35,017	–	35,017	Interest rate or foreign exchange risk
Customer accounts	437,181	–	437,181	Interest rate or foreign exchange risk
Debt securities in issue	53,859	–	53,859	Interest rate mainly, but also foreign exchange or equity risk
Derivative financial instruments	47,209	46,839	370	Interest rate, foreign exchange, commodity or equity risk
Short positions	3,226	3,226	–	Interest rate, foreign exchange, commodity or equity risk
Total	576,492	50,065	526,427	

Structural foreign exchange exposures

The table below sets out the principal structural foreign exchange exposures (net of investment hedges) of the Group.

	31.12.18 $million	01.01.18 $million	31.12.17 $million
Hong Kong dollar	**7,792**	7,028	7,119
Indian rupee	**3,819**	4,782	4,806
Renminbi	**2,900**	3,767	3,784
Singapore dollar	**2,852**	2,874	2,972
Korean won	**2,148**	2,284	2,361
Taiwanese dollar	**1,238**	1,569	1,589
UAE dirham	**1,852**	1,785	1,842
Malaysian ringgit	**1,513**	1,453	1,512
Thai baht	**1,304**	1,277	1,277
Indonesian rupiah	**999**	1,073	1,090
Pakistani rupee	**458**	545	543
Other	**3,999**	3,909	4,000
	30,874	32,346	32,895

As at 31 December 2018, the Group had taken net investment hedges using derivative financial investments of $2,137 million (2017: $2,003 million) to partly cover its exposure to the Korean won, $800 million (2017: $792 million) to partly cover its exposure to the Taiwanese dollar, $1,606 million (2017: $490 million) to partly cover its exposure to the Renminbi and $712 million to partly cover its exposure to the Indian rupee. An analysis has been performed on these exposures to assess the impact of a 1 per cent fall in the US dollar exchange rates, adjusted to incorporate the impacts of correlations of these currencies to the US dollar. The impact on the positions above would be an increase of $336 million (2017: $357 million). Changes in the valuation of these positions are taken to reserves.

For analysis of the Group's capital position and requirements, refer to the Capital Review (page 218).

Counterparty credit risk

Counterparty credit risk is the potential for loss in the event of the default of a derivative counterparty, after taking into account the value of eligible collaterals and risk mitigation techniques. The Group's counterparty credit exposures are included in the Credit risk section.

Derivative financial instruments credit risk mitigation

The Group enters into master netting agreements, which in the event of default result in a single amount owed by or to the counterparty through netting the sum of the positive and negative mark-to-market values of applicable derivative transactions. The value of exposure under master netting agreements is $32,283 million (2017: $29,135 million).

In addition, the Group enters into credit support annexes (CSAs) with counterparties where collateral is deemed a necessary or desirable mitigant to the exposure. Cash collateral includes collateral called under a variation margin process from counterparties if total uncollateralised mark-to-market exposure exceeds the threshold and minimum transfer amount specified in the CSA. With certain counterparties, the CSA is reciprocal and requires us to post collateral if the overall mark-to-market values of positions are in the counterparty's favour and exceed an agreed threshold. The Group holds $6,834 million (2017: $6,562 million) under CSAs.

Liquidity and Funding risk

Liquidity and Funding risk is the risk that we may not have sufficient stable or diverse sources of funding to meet our obligations as they fall due.

The Group's liquidity and funding risk approach requires each country to ensure that it operates within predefined liquidity limits and remain in compliance with Group liquidity policies and practices, as well as local regulatory requirements.

The Group achieves this through a combination of setting Risk Appetite and associated limits, policy formation, risk measurement and monitoring, prudential and internal stress testing, governance and review.

Since the beginning of the year, there were no significant changes in treasury policies as disclosed in the 2017 Annual Report and Accounts.

The Group has relatively low levels of sterling and euro funding and exposures within the context of the overall Group balance sheet. The result of the UK referendum to leave the EU has therefore not had a material first order liquidity impact.

Primary sources of funding

The Group's funding strategy is largely driven by its policy to maintain adequate liquidity at all times, in all geographic locations and for all currencies, and hence to be in a position to meet all obligations as they fall due. The Group's funding profile is therefore well diversified across different sources, maturities and currencies.

A substantial portion of our assets are funded by customer deposits aligned with our policy to fund customer assets predominantly using customer deposits. Wholesale funding is diversified by type and maturity and represents a stable source of funds for the Group.

We maintain access to wholesale funding markets in all major financial centres in which we operate. This seeks to ensure that we have market intelligence, maintain stable funding lines and can obtain optimal pricing when performing our interest rate risk management activities.

In 2018, the Group issued approximately $4.6 billion of senior debt securities and $0.5 billion of subordinated debt securities from its holding company (HoldCo) Standard Chartered PLC (2017: $1.5 billion of term senior debt and $1 billion of Additional Tier 1).

Debt refinancing levels are low. In the next 12 months approximately $3.9 billion of the Group's HoldCo senior debt is falling due for repayment either contractually or callable by the Group.

The information presented in the Liquidity pool section (page 186) is on a financial view. This is the location in which the transaction or balance was booked and provides a more accurate view of where liquidity risk is actually located.

The chart below shows the composition of liabilities in which customer deposits make up 63.5 per cent of total liabilities as at 31 December 2018, the majority of which are current accounts, savings accounts and time deposits. Our largest customer deposit base by geography is Greater China & North Asia (in particular Hong Kong), which holds 44.9 per cent of Group customer accounts.

Group's composition of liabilities 31 December 2018

Liquidity and funding risk metrics

We monitor key liquidity metrics regularly, both on a country basis and in aggregate across the Group.

The following liquidity and funding Board Risk Appetite metrics define the maximum amount and type of risk that the Group is willing to assume in pursuit of its strategy: Liquidity Coverage Ratio (LCR), liquidity stress survival horizons, external wholesale borrowing, and advances-to-deposits ratio.

Liquidity Coverage Ratio (unaudited)

The LCR is a regulatory requirement set to ensure that the Group has sufficient unencumbered high-quality liquid assets to meet its liquidity needs in a 30-calendar-day liquidity stress scenario.

The Group monitors and reports its liquidity position under European Commission Delegated Regulation 2015/61 and has maintained its liquidity position above the prudential requirement.

At the reporting date, the Group LCR was 154 per cent (2017: 146 per cent) with a prudent surplus to both Board-approved Risk Appetite and regulatory requirements. The ratio increased 8 per cent year-on-year due to an increase in our liquidity buffer partially aligned to the growth in our overall balance sheet as we continued to focus on high-quality liquidity across our businesses. We also held adequate liquidity across our footprint to meet all local prudential LCR requirements, where applicable.

	31.12.18 $million	31.12.17 $million
Liquidity buffer	**149,602**	132,251
Total net cash outflows	**97,443**	90,691
Liquidity coverage ratio	**154%**	146%

For a more detailed Group LCR disclosure, refer to Section 6 of the Group's 2018 Pillar 3 Disclosures.

Stressed coverage (unaudited)

The Group intends to maintain a prudent and sustainable funding and liquidity position, in all countries and currencies, such that it can withstand a severe but plausible liquidity stress.

Our approach to managing liquidity and funding is reflected in the following Board-level Risk Appetite statement.

"The Group should hold an adequate buffer of high-quality liquid assets to survive extreme but plausible liquidity stress scenarios for at least 60 days without recourse to extraordinary central bank support."

The Group's internal liquidity stress testing framework covers the following stress scenarios:

- Standard Chartered-specific – this scenario captures the liquidity impact from an idiosyncratic event affecting Standard Chartered only i.e. the rest of the market is assumed to operate normally
- Market wide – this scenario captures the liquidity impact from a market wide crisis affecting all participants in a country, region or globally
- Combined – this scenario assumes both Standard Chartered-specific and Market-wide events affecting the Group simultaneously and hence the most severe scenario

All scenarios include, but are not limited to, modelled outflows for retail and wholesale funding, off-balance sheet funding risk, cross currency funding risk, intraday risk, franchise risk and risks associated with a deterioration of a firm's credit rating.

Stress testing results show that a positive surplus was maintained under all scenarios at 31 December 2018 i.e. respective countries are able to survive for a period of time as defined under each scenario. The Combined scenario at 31 December 2018 showed the Group maintained liquidity resources to survive greater than 60 days, as per our Board Risk Appetite. The results take into account currency convertibility and portability constraints across all major presence countries.

Standard Chartered Bank's credit ratings as at 31 December 2018 were A+ with stable outlook (Fitch), A with stable outlook (S&P) and A1 with stable outlook (Moody's). A downgrade in the Group's long-term credit ratings would increase derivative collateral requirements and outflows due to rating-linked liabilities. At 31 December 2018, the estimated contractual outflow of a two-notch long-term ratings downgrade is $1.6 billion (unaudited).

For further information on the Group's liquidity stress testing framework refer to the Risk Management Approach (page 205).

External wholesale borrowing

The Board sets a risk limit to prevent excessive reliance on wholesale borrowing. Limits are applied to all branches and operating subsidiaries in the Group and as at the reporting date the Group remained within Board Risk Appetite.

Advances-to-deposits ratio

This is defined as the ratio of total loans and advances to customers relative to total customer accounts. An advances-to-deposits ratio of below 100 per cent demonstrates that customer deposits exceed customer loans as a result of the emphasis placed on generating a high level of funding from customers.

The advances-to-deposits ratio (2018: 64.9 per cent) decreased from the previous year (2017: 67.0 per cent).

Loans and advances to customers have increased 3 per cent since the end of 2017 to $258 billion. This growth was largely due to higher Corporate Finance balances in Hong Kong as well as growth in our Transaction Banking and Wealth Management businesses. This growth was partially offset by a reduction in lending and retail mortgages primarily due to unfavourable foreign exchange movements in Korea, Singapore and Hong Kong.

Customer accounts have also increased 6 per cent from the end of 2017 to $398 billion as the Group focused on high-quality liquidity across its businesses with an emphasis on Retail Banking, Transaction Banking and other deposits with high liquidity and regulatory value.

	31.12.18 $million	31.12.17[1] $million
Total loans and advances to customers[2]	**258,334**	251,625
Total customer accounts[3]	**397,764**	375,745
Advances-to-deposits ratio	**64.9%**	67.0%

1 The 2017 comparatives have been represented to exclude reverse repurchase agreements of $33,928 million and repurchase agreements of $35,979 million

2 Excludes reverse repurchase agreement and other similar secured lending of $3,151 million and includes loans and advances to customers held at fair value through profit and loss of $4,928 million

3 Includes customer accounts held at fair value through profit or loss of $6,751 million

Net stable funding ratio (NSFR) (unaudited)

On 23 November 2016, the European Commission, as part of a package of risk-reducing measures, proposed a binding requirement for stable funding NSFR at European Union level. The proposal aims to implement the European Banking Authority's interpretation of the Basel standard on NSFR (BCBS295). Pending implementation of the final rules, the Group continues to monitor NSFR in line with the final recommendation from the Basel Committee on Banking Supervision (BCBS).

The NSFR is a balance sheet metric which requires institutions to maintain a stable funding profile in relation to the characteristics of their assets and off-balance sheet activities over a one-year horizon. It is the ratio between the amount of available stable funding (ASF) and the amount of required stable funding (RSF). ASF factors are applied to balance sheet liabilities and capital, based on their perceived stability and the amount of stable funding they provide. Likewise, RSF factors are applied to assets and off-balance sheet exposures according to the amount of stable funding they require. At the last reporting date, the Group NSFR remained above 100 per cent.

Liquidity pool (unaudited)

The liquidity value of the Group's LCR eligible liquidity pool at the reporting date was $150 billion. The figures in the below table account for haircuts, currency convertibility and portability constraints, and therefore are not directly comparable with the consolidated balance sheet. The pool is held to offset stress outflows as defined in European Commission Delegated Regulation 2015/61.

The pool increased $17 billion year-on-year, reflecting overall balance sheet growth as we continued to improve the quality of our funding base and focus on growing quality and RWA efficient assets. Our liquidity pool composition also changed over the period as we increased our holdings of Level 2A LCR eligible securities.

	31.12.18				
	Greater China & North East Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Level 1 securities					
Cash and balances at central banks	**16,267**	**2,645**	**1,416**	**28,232**	**48,560**
Central banks, governments/public sector entities	**33,462**	**9,900**	**1,540**	**30,166**	**75,068**
Multilateral development banks and international organisations	**1,543**	**1,451**	**195**	**8,487**	**11,676**
Other	**–**	**–**	**–**	**1,125**	**1,125**
Total Level 1 securities	**51,272**	**13,996**	**3,151**	**68,010**	**136,429**
Level 2A securities	**3,943**	**1,083**	**60**	**5,296**	**10,382**
Level 2B securities	**–**	**1,264**	**–**	**1,527**	**2,791**
Total LCR eligible assets	**55,215**	**16,343**	**3,211**	**74,833**	**149,602**

	31.12.17				
	Greater China & North East Asia $million	ASEAN & South Asia $million	Africa & Middle East $million	Europe & Americas $million	Total $million
Level 1 securities					
Cash and balances at central banks	13,779	2,400	1,708	33,191	51,078
Central banks, governments/public sector entities	28,187	12,265	1,064	24,464	65,980
Multilateral development banks and international organisations	–	563	159	8,568	9,290
Other	–	–	–	130	130
Total Level 1 securities	41,966	15,228	2,931	66,353	126,478
Level 2A securities	2,234	825	113	1,147	4,319
Level 2B securities	–	246	3	1,206	1,455
Total LCR eligible assets	44,200	16,299	3,047	68,706	132,252

Encumbrance (unaudited)

Encumbered assets

Encumbered assets represent on-balance sheet assets pledged or subject to any form of arrangement to secure, collateralise or credit enhance a transaction from which it cannot be freely withdrawn. Cash collateral pledged against derivatives and Hong Kong government certificates of indebtedness, which secure the equivalent amount of Hong Kong currency notes in circulation, are included within Other assets.

Unencumbered – readily available for encumbrance

Unencumbered assets that are considered by the Group to be readily available in the normal course of business to secure funding, meet collateral needs, or be sold to reduce potential future funding requirements and are not subject to any restrictions on their use for these purposes.

Unencumbered – other assets capable of being encumbered

Unencumbered assets that, in their current form, are not considered by the Group to be readily realisable in the normal course of business to secure funding, meet collateral needs, or be sold to reduce potential future funding requirements and are not subject to any restrictions on their use for these purposes. Included within this category are loans and advances which would be suitable for use in secured funding structures such as securitisations.

Unencumbered – cannot be encumbered

Unencumbered assets that have not been pledged and cannot be used to secure funding, meet collateral needs, or be sold to reduce potential future funding requirements, as assessed by the Group.

Derivatives, reverse repurchase assets and stock lending

These assets are shown separately as these on-balance sheet amounts cannot be pledged. However, these assets can give rise to off-balance sheet collateral which can be used to raise secured funding or meet additional funding requirements.

The following table provides a reconciliation of the Group's encumbered assets to total assets.

	31.12.18									
		Assets encumbered as a result of transactions with counterparties other than central banks			Other assets (comprising assets encumbered at the central bank and unencumbered assets)					
						Assets not positioned at the central bank				
	Assets $million	As a result of securitisations $million	Other $million	Total $million	Assets positioned at the central bank (i.e. pre-positioned plus encumbered) $million	Readily available for encumbrance $million	Other assets that are capable of being encumbered $million	Derivatives and reverse repo/stock lending $million	Cannot be encumbered $million	Total $million
Cash and balances at central banks	57,511	–	–	–	8,152	49,359	–	–	–	57,511
Derivative financial instruments	45,621	–	–	–	–	–	–	45,621	–	45,621
Loans and advances to banks	82,065	447	–	447	–	45,623	13,918	20,698	1,379	81,618
Loans and advances to customers	299,371	497	7	504	–	–	243,802	41,037	14,028	298,867
Investment securities	149,568	–	7,521	7,521	–	95,523	40,591	–	5,933	142,047
Other assets	35,401	–	16,287	16,287	–	–	11,440	–	7,674	19,114
Current tax assets	492	–	–	–	–	–	–	–	492	492
Prepayments and accrued income	2,505	–	–	–	–	–	1,356	–	1,149	2,505
Interests in associates and joint ventures	2,307	–	–	–	–	–	–	–	2,307	2,307
Goodwill and intangible assets	5,056	–	–	–	–	–	–	–	5,056	5,056
Property, plant and equipment	6,490	–	–	–	–	–	400	–	6,090	6,490
Deferred tax assets	1,047	–	–	–	–	–	–	–	1,047	1,047
Assets classified as held for sale	1,328	–	–	–	–	–	–	–	1,328	1,328
Total	688,762	944	23,815	24,759	8,152	190,505	311,507	107,356	46,483	664,003

	31.12.17 (IAS 39)									
		Assets encumbered as a result of transactions with counterparties other than central banks			Other assets (comprising assets encumbered at the central bank and unencumbered assets)					
						Assets not positioned at the central bank				
	Assets $million	As a result of securitisations $million	Other $million	Total $million	Assets positioned at the central bank (i.e. pre-positioned plus encumbered) $million	Readily available for encumbrance $million	Other assets that are capable of being encumbered $million	Derivatives and reverse repo/stock lending $million	Cannot be encumbered $million	Total $million
Cash and balances at central banks	58,864	–	–	–	9,761	49,103	–	–	–	58,864
Derivative financial instruments	47,031	–	–	–	–	–	–	47,031	–	47,031
Loans and advances to banks	81,325	–	–	–	–	47,380	5,333	21,260	7,352	81,325
Loans and advances to customers	285,553	11	–	11	–	–	232,328	33,928	19,286	285,542
Investment securities	138,187	–	8,213	8,213	178	91,928	29,967	–	7,901	129,974
Other assets	33,490	–	14,930	14,930	–	–	11,604	–	6,956	18,560
Current tax assets	491	–	–	–	–	–	–	–	491	491
Prepayments and accrued income	2,307	–	–	–	–	–	1,503	–	804	2,307
Interests in associates and joint ventures	2,307	–	–	–	–	–	–	–	2,307	2,307
Goodwill and intangible assets	5,013	–	–	–	–	–	352	–	4,661	5,013
Property, plant and equipment	7,211	–	–	–	–	–	1,148	–	6,063	7,211
Deferred tax assets	1,177	–	–	–	–	–	–	–	1,177	1,177
Assets classified as held for sale	545	–	–	–	–	–	–	–	545	545
Total	663,501	11	23,143	23,154	9,939	188,411	282,235	102,219	57,543	640,347

The Group received $85,768 million (2017: $72,982 million) as collateral under reverse repurchase agreements, that was eligible for repledging; of this the Group sold or repledged $40,552 million (2017: $34,018 million) under repurchase agreements.

Liquidity analysis of the Group's balance sheet

Contractual maturity of assets and liabilities

The following table presents assets and liabilities by maturity groupings based on the remaining period to the contractual maturity date as at the balance sheet date on a discounted basis. Contractual maturities do not necessarily reflect actual repayments or cashflows.

Within the tables below, cash and balances with central banks, interbank placements and investment securities that are fair value through other comprehensive income are used by the Group principally for liquidity management purposes.

As at the reporting date, assets remain predominantly short-dated, with 61 per cent maturing in under one year. Our less than three month cumulative net funding gap increased from the previous year, largely due to an increase in customer accounts as the Group focused on improving the quality of its deposit base. In practice, these deposits are recognised as stable and have behavioural profiles that extend beyond their contractual maturities.

	31.12.18								
	One month or less $million	Between one month and three months $million	Between three months and six months $million	Between six months and nine months $million	Between nine months and one year $million	Between one year and two years $million	Between two years and five years $million	More than five years and undated $million	Total $million
Assets									
Cash and balances at central banks	49,359	–	–	–	–	–	–	8,152	57,511
Derivative financial instruments	6,902	5,861	5,827	3,509	2,333	4,458	8,079	8,652	45,621
Loans and advances to banks[1,2]	38,331	20,549	11,209	5,214	2,835	2,584	1,064	279	82,065
Loans and advances to customers[1,2]	84,846	33,756	18,133	11,641	10,321	17,519	39,306	83,849	299,371
Investment securities	15,297	13,589	14,131	14,300	17,402	25,695	31,303	17,851	149,568
Other assets	21,155	8,909	2,385	224	135	96	155	21,567	54,626
Total assets	215,890	82,664	51,685	34,888	33,026	50,352	79,907	140,350	688,762
Liabilities									
Deposits by banks[1,3]	30,368	2,593	572	553	397	244	230	60	35,017
Customer accounts[1,4]	331,633	51,553	23,643	10,966	11,634	3,631	1,154	2,967	437,181
Derivative financial instruments	7,467	6,072	6,136	3,544	2,140	5,257	8,886	7,707	47,209
Senior debt	1,259	959	509	5,087	667	2,878	6,327	10,093	27,779
Other debt securities in issue[1]	4,893	9,792	8,062	177	715	1,030	16	1,395	26,080
Other liabilities	22,835	8,698	4,130	852	536	868	401	11,823	50,143
Subordinated liabilities and other borrowed funds	23	17	–	–	–	2,522	4,421	8,018	15,001
Total liabilities	398,478	79,684	43,052	21,179	16,089	16,430	21,435	42,063	638,410
Net liquidity gap	(182,588)	2,980	8,633	13,709	16,937	33,922	58,472	98,287	50,352

1 Loans and advances, investment securities, deposits by banks, customer accounts and debt securities in issue include financial instruments held at fair value through profit or loss, see Note 13 Financial instruments

2 Loans and advances include reverse repurchase agreements and other similar secured lending of $61.7 billion

3 Deposits by banks include repurchase agreements and other similar secured borrowing of $5 billion

4 Customer accounts include repurchase agreements and other similar secured borrowing of $39.4 billion

	31.12.17								
	One month or less $million	Between one month and three months $million	Between three months and six months $million	Between six months and nine months $million	Between nine months and one year $million	Between one year and two years $million	Between two years and five years $million	More than five years and undated $million	Total $million
Assets									
Cash and balances at central banks	49,103	–	–	–	–	–	–	9,761	58,864
Derivative financial instruments	6,284	7,706	5,930	3,537	2,601	5,427	7,111	8,435	47,031
Loans and advances to banks[1,2]	36,548	21,238	12,042	4,299	3,612	1,588	1,386	612	81,325
Loans and advances to customers[1,2]	87,794	32,618	17,459	11,357	8,545	17,500	37,237	73,043	285,553
Investment securities	14,185	18,208	13,692	11,213	9,145	22,369	31,660	17,715	138,187
Other assets	19,349	4,466	2,521	105	247	138	127	25,588	52,541
Total assets	213,263	84,236	51,644	30,511	24,150	47,022	77,521	135,154	663,501
Liabilities									
Deposits by banks[1,3]	29,365	2,484	1,437	530	730	154	135	651	35,486
Customer accounts[1,4]	327,434	37,178	19,716	10,775	9,321	3,115	1,746	2,439	411,724
Derivative financial instruments	8,018	8,035	6,068	3,544	2,685	5,057	7,794	6,900	48,101
Senior debt	67	273	1,801	53	1,937	5,053	4,747	5,585	19,516
Other debt securities in issue[1]	4,139	10,616	9,954	2,005	779	1,091	794	4,508	33,886
Other liabilities	20,428	5,988	3,672	671	303	696	897	13,150	45,805
Subordinated liabilities and other borrowed funds	–	116	1,382	–	–	–	3,887	11,791	17,176
Total liabilities	389,451	64,690	44,030	17,578	15,755	15,166	20,000	45,024	611,694
Net liquidity gap	(176,188)	19,546	7,614	12,933	8,395	31,856	57,521	90,130	51,807

1 Loans and advances, investment securities, deposits by banks, customer accounts and debt securities in issue include financial instruments held at fair value through profit or loss, see Note 13 Financial instruments

2 Loans and advances include reverse repurchase agreements and other similar secured lending of $55.2 billion

3 Deposits by banks include repurchase agreements and other similar secured borrowing of $3.8 billion

4 Customer accounts include repurchase agreements and other similar secured borrowing of $36.0 billion

Behavioural maturity of financial assets and liabilities

The cash flows presented in the previous section reflect the cash flows that will be contractually payable over the residual maturity of the instruments. However, contractual maturities do not necessarily reflect the timing of actual repayments or cash flow. In practice, certain assets and liabilities behave differently from their contractual terms, especially for short-term customer accounts, credit card balances and overdrafts, which extend to a longer period than their contractual maturity. On the other hand, mortgage balances tend to have a shorter repayment period than their contractual maturity date. Expected customer behaviour is assessed and managed on a country basis using qualitative and quantitative techniques, including analysis of observed customer behaviour over time.

Maturity of financial liabilities on an undiscounted basis

The following table analyses the contractual cash flows payable for the Group's financial liabilities by remaining contractual maturities on an undiscounted basis. The financial liability balances in the table below will not agree to the balances reported in the consolidated balance sheet as the table incorporates all contractual cash flows, on an undiscounted basis, relating to both principal and interest payments. Derivatives not treated as hedging derivatives are included in the 'on demand' time bucket and not by contractual maturity.

Within the 'More than five years and undated' maturity band are undated financial liabilities, all of which relate to subordinated debt, on which interest payments are not included as this information would not be meaningful given the instruments are undated. Interest payments on these instruments are included within the relevant maturities up to five years.

	31.12.18								
	One month or less $million	Between one month and three months $million	Between three months and six months $million	Between six months and nine months $million	Between nine months and one year $million	Between one year and two years $million	Between two years and five years $million	More than five years and undated $million	Total $million
Deposits by banks	**30,467**	**2,609**	**593**	**569**	**409**	**267**	**250**	**62**	**35,226**
Customer accounts	**332,115**	**51,845**	**24,686**	**11,094**	**11,780**	**3,700**	**1,226**	**3,552**	**439,998**
Derivative financial instruments[1]	**45,665**	**137**	**141**	**9**	**91**	**31**	**679**	**456**	**47,209**
Debt securities in issue	**6,169**	**11,345**	**8,786**	**5,310**	**1,628**	**3,685**	**7,104**	**13,000**	**57,027**
Subordinated liabilities and other borrowed funds	**23**	**–**	**255**	**–**	**414**	**3,169**	**6,154**	**13,865**	**23,880**
Other liabilities	**19,746**	**8,757**	**4,129**	**892**	**520**	**885**	**407**	**12,302**	**47,638**
Total liabilities	**434,185**	**74,693**	**38,590**	**17,874**	**14,842**	**11,737**	**15,820**	**43,237**	**650,978**

	31.12.17								
	One month or less $million	Between one month and three months $million	Between three months and six months $million	Between six months and nine months $million	Between nine months and one year $million	Between one year and two years $million	Between two years and five years $million	More than five years and undated $million	Total $million
Deposits by banks	29,427	2,497	1,460	545	743	160	150	697	35,679
Customer accounts	327,501	37,353	20,720	10,901	9,463	3,178	1,840	2,919	413,875
Derivative financial instruments[1]	47,267	–	3	–	153	166	246	266	48,101
Debt securities in issue	4,287	10,888	11,878	2,141	2,876	6,550	6,163	11,769	56,552
Subordinated liabilities and other borrowed funds	126	207	1,490	210	166	657	3,726	19,356	25,938
Other liabilities	20,800	6,052	3,676	681	324	720	929	11,241	44,423
Total liabilities	429,408	56,997	39,227	14,478	13,725	11,431	13,054	46,248	624,568

1 Derivatives are on a discounted basis

Interest rate risk in the banking book (unaudited)

The following table provides the estimated impact on the Group's earnings of a 50bps parallel shock (up and down) across all yield curves. The sensitivities shown represent the estimated change in base case projected net interest income, plus the change in interest rate implied income and expense from FX swaps used to manage banking book currency positions, under the two interest rate shock scenarios.

The interest rate sensitivities are indicative and based on simplified scenarios, estimating the aggregate impact of an instantaneous 50bps parallel shock across all yield curves over a one-year horizon, including the time taken to implement changes to pricing before becoming effective. The assessment assumes that non-interest rate sensitive aspects of the size and mix of the balance sheet remain constant and that there are no specific management actions in response to the change in rates. No assumptions are made in relation to the impact on credit spreads in a changing rate environment.

Significant modelling and behavioural assumptions are made regarding scenario simplification, market competition, pass-through rates, asset and liability re-pricing tenors, and price flooring. In particular, the assumption that interest rates of all currencies and maturities shift by the same amount concurrently, and that no actions are taken to mitigate the impacts arising from this are considered unlikely. Reported sensitivities will vary over time due to a number of factors including changes in balance sheet composition, market conditions, customer behaviour and risk management strategy and should therefore not be considered an income or profit forecast.

	31.12.18			
Estimated one-year impact to earnings from a parallel shift in yield curves at the beginning of the period of:	USD bloc $million	HKD, SGD & KRW bloc $million	Other currency bloc $million	Total $million
+ 50bps	**10**	**110**	**90**	**210**
– 50bps	**(20)**	**(70)**	**(90)**	**(180)**

	31.12.17			
Estimated one-year impact to earnings from a parallel shift in yield curves at the beginning of the period of:	USD bloc $million	HKD, SGD & KRW bloc $million	Other currency bloc $million	Total $million
+ 50bps	70	120	140	330
– 50bps	(50)	(100)	(140)	(290)

As at 31 December 2018, the Group estimates the one-year impact of an instantaneous, parallel increase across all yield curves of 50bps to be an earnings benefit of $210 million. The corresponding impact from a parallel decrease of 50bps would result in an earnings reduction of $180 million.

The benefit from rising interest rates is primarily from reinvesting at higher yields and from assets re-pricing faster and to a greater extent than deposits. The current estimate for US dollar sensitivity has reduced since December 2017 on rising deposit sensitivity to changes in interest rates.

The US dollar sensitivity is also impacted by the dampening effect due to the asymmetry of funding trading book assets with banking book liabilities. The sensitivities include the cost of banking book liabilities used to fund the trading book, however the revenue associated with the trading book positions is recognised in net trading income.

This asymmetry in both the up and down scenarios should be broadly offset within total operating income.

Operational risk (unaudited)

Operational risks arise from the processes executed within the Group. Risks associated with these processes are mapped into a Group Process Universe where the standardised Control Assessment Standards are applied. The standards are benchmarked against regulatory requirements.

A summary of our operational risk management approach is provided in the Risk management approach (page 206).

Operational risk profile

The operational risk profile is the Group's overall exposure to non-financial risk, at a given point in time, covering all Principal Risk Types. The operational risk profile comprises both operational risk events (including losses) and the current exposures to non-financial risks.

Operational risk events and losses

Operational losses are one indicator of the effectiveness and robustness of the non-financial risk control environment. As at 31 December 2018, recorded operational losses for 2018 are lower than 2017. Operational losses in 2018 comprise unrelated non-systemic events which were not individually significant.

Losses in 2017 include incremental events that were recognised in 2018 and reclassification of Basel event types and Basel business lines. As at 31 December 2018, the largest loss recorded for 2017 relates to an internal fraud loss of $21.7 million in the Retail Banking Basel business line.

The Group's profile of operational loss events in 2018 and 2017 is summarised in the table below. It shows the percentage distribution of gross operational losses by Basel business line. This does not include provision made for potential penalties relating to US investigation, the FCA decision and previously disclosed foreign trading issues, which will be assessed when settled. Further details are set out in Note 26 on page 305.

	% Loss	
Distribution of operational losses by Basel business line	**31.12.18**	31.12.17
Agency services	**1.4%**	2.4%
Commercial Banking	**6.7%**	13.8%
Corporate Finance	**–**	3.4%
Corporate items	**5.5%**	3.2%
Payment and settlements	**14.6%**	1.4%
Retail Banking	**53.8%**	45.8%
Retail brokerage	**0.1%**	0.1%
Trading and sales	**17.9%**	29.9%

The Group's profile of operational loss events in 2018 and 2017 is also summarised by Basel event type in the table below. It shows the percentage distribution of gross operational losses by Basel event type. This does not include provision made for potential penalties relating to US investigation, the FCA decision and previously disclosed foreign trading issues, which will be assessed when settled. Further details are set out in Note 26 on page 305.

	% Loss	
Distribution of operational losses by Basel event type	**31.12.18**	31.12.17
Business disruption and system failures	**5.8%**	0.4%
Clients products and business practices	**1.9%**	33.4%
Damage to physical assets	**0.1%**	0.0%
Employment practices and workplace safety	**0.2%**	0.1%
Execution delivery and process management	**53.1%**	31.5%
External fraud	**36.4%**	17.6%
Internal fraud	**2.5%**	17.0%

Other principal risks (unaudited)

Losses arising from operational failures for other principal risks (for example: Compliance, Conduct, Reputational, Information and Cyber Security and Financial Crime) are reported as operational losses. Operational losses do not include operational risk-related credit impairments.

Enterprise Risk Management Framework

Effective risk management is essential in providing consistent and sustainable performance for all of our stakeholders and is therefore a central part of the financial and operational management of the Group. The Group adds value to clients, and therefore the communities in which they operate, generating returns for shareholders by taking and managing risk.

The Enterprise Risk Management Framework (ERMF), launched in January 2018, enables the Group to manage enterprise-wide risks, with the objective of maximising risk-adjusted returns while remaining within our Risk Appetite. The ERMF has been designed with the explicit goal of improving the Group's risk management. Over the year, awareness of the ERMF has increased significantly and we have made good progress in delivering the key initiatives started in 2017 to embed the framework across the organisation.

Key initiatives achieved in 2018

Throughout the year, awareness of the ERMF has increased leading to a stronger risk culture across the three lines of defence. We have:

- Formalised the links between our strategy, Risk Appetite and risk identification to develop management processes that clearly integrate risk considerations into strategic decision making
- Established clear individual accountability for risk management
- Enhanced our risk scanning processes to enable more dynamic and forward looking assessments of risk
- Established a well balanced risk taxonomy including financial and non financial Principal Risk Types (pages 198 to 212)
- Developed consistent, integrated and distinct Risk Type Frameworks for our ten Principal Risk Types
- Increased Risk Appetite coverage on non financial Principal Risk Types
- Aligned our risk committees to the ERMF. Furthermore, to ensure adequate coverage of non financial Principal Risk Types, we have remodelled the Group Operational Risk Committee to the Group Non Financial Risk Committee
- Completed a 2018 ERMF Effectiveness Review which provides an objective baseline against which progress can be measured over the coming years.

We will carry this momentum into 2019 as we continue to roll out the ERMF and Risk Type Frameworks across the Group, including the branches and subsidiaries, as well as launching training programmes to ensure awareness and stakeholder engagement.

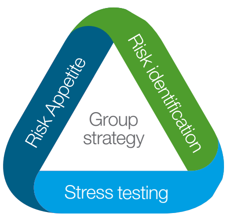
Risk culture

The Group's risk culture provides guiding principles for the behaviours expected from our people when managing risk. The Board has approved a risk culture statement that encourages the following behaviours and outcomes:

- An enterprise-level ability to identify and assess current and future risks, openly discuss these and take prompt actions
- The highest level of integrity by being transparent and proactive in disclosing and managing all types of risks
- A constructive and collaborative approach in providing oversight and challenge, and taking decisions in a timely manner
- Everyone to be accountable for their decisions and feel safe in using their judgement to make these considered decisions

We acknowledge that banking inherently involves risk-taking and undesired outcomes will occur from time to time; however, we shall take the opportunity to learn from our experience and formalise what we can do to improve. We expect managers to demonstrate a high awareness of risk and control by self-identifying issues and managing them in a manner that will deliver lasting change.

Strategic risk management



The Group approaches strategic risk management by:

- Including in the strategy review process, an impact analysis on the risk profile from growth plans, strategic initiatives and business model vulnerabilities with the aim of proactively identifying and managing new risks or existing risks that need to be reprioritised
- Including in the strategy review process, a confirmation that growth plans and strategic initiatives can be delivered within the approved Risk Appetite and/or proposing additional Risk Appetite for Board consideration
- Validating the Corporate Plan against the approved or proposed Risk Appetite Statement to the Board. The Board approves the strategy review and the five-year Corporate Plan with a confirmation from the Group Chief Risk Officer that it is aligned with the ERMF and the Group Risk Appetite Statement where projections allow

Roles and responsibilities

Three lines of defence model

Roles and responsibilities for risk management are defined under a three lines of defence model. Each line of defence has a specific set of responsibilities for risk management and control as shown in the table on the next page.

Senior Managers Regime

Roles and responsibilities under the ERMF are aligned to the objectives of the Senior Managers Regime. The Group Chief Risk Officer is responsible for the overall development and maintenance of the Group's ERMF and for identifying material risk types to which the Group may be potentially exposed. The Group Chief Risk Officer delegates effective implementation of the Risk Type Frameworks to Risk Framework Owners who provide second line of defence oversight for the Principal Risk Types.

The Risk function

The Risk function is responsible for the sustainability of our business through good management of risk across the Group, and ensuring that business is conducted in line with regulatory expectations.

The Group Chief Risk Officer directly manages the Risk function that is separate and independent from the origination, trading and sales functions of the businesses. The Risk function is responsible for:

Lines of defence	Definition	Key responsibilities include
1st	The businesses and functions engaged in or supporting revenue-generating activities that own and manage risks	→ Propose the risks required to undertake revenue-generating activities → Identify, monitor and escalate risks and issues to the second line and senior management[1] and promote a healthy risk culture and good conduct → Manage risks within Risk Appetite, set and execute remediation plans and ensure laws and regulations are being complied with → Ensure systems meet risk data aggregation, risk reporting and data quality requirements set by the second line
2nd	The control functions independent of the first line that provide oversight and challenge of risk management to provide confidence to the Group Chief Risk Officer, the Management Team and the Board	→ Identify, monitor and escalate risks and issues to the Group Chief Risk Officer, senior management[1] and the Board and promote a healthy risk culture and good conduct → Oversee and challenge first line risk-taking activities and review first line risk proposals → Propose Risk Appetite to the Board, monitor and report adherence to Risk Appetite and intervene to curtail business if it is not in line with existing or adjusted Risk Appetite → Set risk data aggregation, risk reporting and data quality requirements
3rd	The independent assurance provided by the Group Internal Audit function on the effectiveness of controls that support the first line's risk management of business activities, and the processes maintained by the second line. Its role is defined and overseen by the Audit Committee of the Board	→ Independently assess whether management has identified the key risks in the business and whether these are reported and governed in line with the established risk management processes → Independently assess the adequacy of the design of controls and their operating effectiveness

1 Senior management in this table refers to individuals designated as senior management functions under the FCA and PRA Senior Managers Regime (SMR)

- Maintaining the ERMF, ensuring it remains relevant and appropriate to the Group's business activities, is effectively communicated and implemented across the Group and administering related governance and reporting processes
- Upholding the overall integrity of the Group's risk and return decisions to ensure that risks are properly assessed, that these decisions are made transparently on the basis of this proper assessment and that risks are controlled in accordance with the Group's standards and Risk Appetite, and
- Overseeing and challenging the management of Principal Risk Types under the ERMF

The independence of the Risk function ensures that the necessary balance in making risk and return decisions is not compromised by short-term pressures to generate revenues.

In addition, the Risk function is a centre of excellence that provides specialist capabilities of relevance to risk management processes in the broader organisation.

The Risk function supports the Group's commitment to be Here for good by building a sustainable framework that places regulatory and compliance standards, and a culture of appropriate conduct at the forefront of the Group's agenda in a manner proportionate to the nature, scale and complexity of the Group's business.

As of 1st January 2019, we have rebranded the Compliance function as Conduct, Financial Crime and Compliance (CFCC), reflecting the integration of the different areas within the function, under the Management Team leadership of the Group Head CFCC. CFCC works alongside the Risk function, within the framework of the ERMF, to deliver an aligned Second Line of Defence.

Risk Appetite and profile

We recognise the following constraints which determine the risks that we are willing to take in pursuit of our strategy and the development of a sustainable business:

- **Risk capacity** is the maximum level of risk the Group can assume, given its current capabilities and resources, before breaching constraints determined by capital and liquidity requirements and internal operational capability (including but not limited to technical infrastructure, risk management capabilities, expertise), or otherwise failing to meet the expectations of regulators and law enforcement agencies.
- **Risk Appetite** is defined by the Group and approved by the Board. It is the maximum amount and type of risk the Group is willing to assume in pursuit of its strategy. Risk Appetite cannot exceed risk capacity.

The Board has approved a Risk Appetite Statement, which is underpinned by a set of financial and operational control parameters known as Risk Appetite metrics and their associated thresholds. These directly constrain the aggregate risk exposures that can be taken across the Group. The Risk Appetite Statement is supplemented by an overarching statement outlining the Group's Risk Appetite Principles.

Risk Appetite Principles

The Group Risk Appetite is defined in accordance with risk management principles that inform our overall approach to risk management and our risk culture. We follow the highest ethical standards required by our stakeholders and ensure a fair outcome for our clients, as well as facilitating the effective operation of financial markets, while at the same time meeting expectations of regulators and law enforcement agencies. We set our Risk Appetite to enable us to grow sustainably and to avoid shocks to earnings or our general financial health, as well as manage our Reputational Risk in a way that does not materially undermine the confidence of our investors and all internal and external stakeholders.

Risk Appetite Statement

The Group will not compromise adherence to its Risk Appetite in order to pursue revenue growth or higher returns.

To keep the Group's Risk profile within Risk Appetite (and therefore also risk capacity), we have cascaded critical Group Risk Appetite metrics across our Principal Risk Types to countries with significant business operations. These are supplemented by risk control tools such as granular level limits, policies, standards and other operational control parameters that are used to keep the Group's risk profile within Risk Appetite. The Group's risk profile is its overall exposure to risk at a given point in time, covering all applicable risk types. Status against Risk Appetite is reported to the Board Risk Committee and the Group Risk Committee, including the status of breaches and remediation plans where applicable. Country Risk Appetite is managed at a country level with Group and regional oversight.

The Group Risk Committee, the Group Financial Crime Risk Committee, the Group Non-Financial Risk Committee and the Group Asset and Liability Committee are responsible for ensuring that our risk profile is managed in compliance with the Risk Appetite set by the Board. The Board Risk Committee and the Board Financial Crime Risk Committee (for Financial Crime Compliance) advise the Board on the Risk Appetite Statement and monitor the Group's compliance with it.

The individual Principal Risk Types' Risk Appetite Statements approved by the Board are set out in the Principal Risks section (pages 198 to 212)

Risk identification and assessment

Identification and assessment of potentially adverse risk events is an essential first step in managing the risks of any business or activity. To ensure consistency in communication we use Principal Risk Types to classify our risk exposures. Nevertheless, we also recognise the need to maintain an overall perspective since a single transaction or activity may give rise to multiple types of risk exposure, risk concentrations may arise from multiple exposures that are closely correlated, and a given risk exposure may change its form from one risk type to another.

To facilitate the above, the Group maintains a dynamic risk scanning process with inputs on the internal and external risk environment, as well as considering potential threats and opportunities from the business and client perspectives. The Group maintains an inventory of the Principal Risk Types and sub-types that are inherent to the strategy and business model, near-term emerging risks that can be measured and mitigated to some extent, and uncertainties that are longer-term matters that should be on the radar but are not yet fully measurable.

Stress testing

The objective of stress testing is to support the Group in assessing that it:

- Does not have a portfolio with excessive concentrations of risk that could produce unacceptably high losses under severe but plausible scenarios
- Has sufficient financial resources to withstand severe but plausible scenarios
- Has the financial flexibility to respond to extreme but plausible scenarios
- Understands the key business model risks, considers what kind of event might crystallise those risks – even if extreme with a low likelihood of occurring – and identifies, as required, actions to mitigate the likelihood or the impact

Enterprise stress tests include Capital and Liquidity Adequacy Stress Tests, including in the context of recovery and resolution, and stress tests that assess scenarios where our business model becomes unviable, such as reverse stress tests.

Stress tests are performed at Group, country, business and portfolio level. Bespoke scenarios are applied to our traded and liquidity positions as described in the sections on Traded Risk (page 202) and Liquidity Risk (page 204). In addition to these, our stress tests also focus on the potential impact of macroeconomic, geopolitical and physical events on relevant regions, client segments and risk types.

The Board delegates approval of stress test submissions to the Bank of England to the Board Risk Committee who reviews the recommendations from the Stress Testing Committee. The Stress Testing Committee is appointed by the Group Risk Committee to review and challenge the stress test scenarios, assumptions and results.

Based on the stress test results, the Group Chief Risk Officer and Group Chief Financial Officer can implement strategic actions to ensure that the Group Strategy remains within the Board-approved Risk Appetite.

Principal Risk Types

Principal Risk Types are risks that are inherent in our strategy and our business model and have been formally defined in the Group's ERMF. These risks are managed through distinct Risk Type Frameworks (RTF) which are approved by the Group Chief Risk Officer. The Principal Risk Types and associated Risk Appetite Statements are approved by the Board.

In 2018, through the development of the RTFs, we have revised the definition of certain Principal Risk Types to describe the risks or failures more explicitly. In addition, Market Risk has been renamed to Traded Risk to encompass all sensitivities to traded price risk. Traded risk now includes Market Risk, Counterparty Credit Risk, Issuer Risk, Valuation Adjustments, Pension Risk and Algorithmic Trading as risk sub-types. The table below shows the Group's current Principal Risk Types.

Principal Risks Types	Definition
Credit Risk	→ Potential for loss due to the failure of a counterparty to meet its agreed obligations to pay the Group
Country Risk	→ Potential for losses due to political or economic events in a country
Traded Risk	→ Potential for loss resulting from activities undertaken by the Group in financial markets
Capital and Liquidity Risk	→ Capital: potential for insufficient level, composition or distribution of capital to support our normal activities → Liquidity: potential for loss where we may not have sufficient stable or diverse sources of funding or financial resources to meet our obligations as they fall due
Operational Risk	→ Potential for loss resulting from inadequate or failed internal processes and systems, human error, or from the impact of external events (including legal risks)
Reputational Risk	→ Potential for damage to the franchise, resulting in loss of earnings or adverse impact on market capitalisation because of stakeholders taking a negative view of the organisation, its actions or inactions – leading stakeholders to change their behaviour
Compliance Risk	→ Potential for penalties or loss to the Group or for an adverse impact to our clients, stakeholders or to the integrity of the markets we operate in through a failure on our part to comply with laws or regulations
Conduct Risk	→ Risk of detriment to the Group's customers and clients, investors, shareholders, market integrity, competition and counterparties or from the inappropriate supply of financial services, including instances of willful or negligent misconduct
Information and Cyber Security Risk	→ Potential for loss from a breach of confidentiality, integrity and availability of the Group's information systems and assets through cyber attack, insider activity, error or control failure
Financial Crime Risk	→ Potential for legal or regulatory penalties, material financial loss or reputational damage resulting from the failure to comply with applicable laws and regulations relating to international sanctions, anti-money laundering and anti-bribery and corruption

Further details of our principal risks and how these are being managed are set out in the Principal Risks section (pages 198 to 212)

ERMF Effectiveness Reviews

The Group Chief Risk Officer is responsible for annually affirming the effectiveness of the ERMF to the Board Risk Committee. To facilitate this, an effectiveness review was carried out which follows the principle of evidence-based self-assessments, for all the Risk Type Frameworks and relevant policies.

The ERMF Effectiveness Review conducted in 2018 provides an objective baseline against which progress can be measured over the coming years. The 2018 Effectiveness Review has shown that:

- The ERMF has been effectively designed to improve the Group's risk management practices through mechanisms which enable management to consistently assess the risk management practices across all risk types, proactively self-identify gaps or improvement opportunities, and develop action plans
- Through the framework, the Group is now able to tangibly measure and monitor effectiveness of its risk management practices
- Financial risks are managed more effectively on a relative basis as compared with the non-financial risks reflecting the maturity of these risk type frameworks

Over the course of 2019, the Group aims to further strengthen its risk management practices and work is underway to fully embed the Risk Type Frameworks for the non-financial risks.

Executive and Board risk oversight

Overview

The Board has ultimate responsibility for risk management and is supported by the six Board-level committees. The Board approves the ERMF based on the recommendation from the Board Risk Committee, which also recommends the Group Risk Appetite Statement other than sections related to Financial Crime Risk. Financial Crime Risk Appetite is reviewed and recommended to the Board by the Board Financial Crime Risk Committee.

The Board appoints the Standard Chartered Bank Court to maintain a sound system of internal control and risk management. The Group Risk Committee, through its authority received from the Court, oversees effective implementation of the ERMF. The Group Chief Risk Officer, as Chair of the Group Risk Committee, approves the use of sub-committees to support the Group Risk Committee to ensure effective risk management across the Group.

The Board Risk Committee receives regular reports on risk management, including the Group's portfolio trends, policies and standards, stress testing, and liquidity and capital adequacy, and is authorised to investigate or seek any information relating to an activity within its terms of reference. The Board Risk Committee also conducts deep-dive reviews on a rolling basis of different sections of the consolidated risk information report that is provided at each scheduled committee meeting.

Risk committee governance structure

BOARD OF DIRECTORS

BOARD LEVEL COMMITTEES

Standard Chartered Bank Court	Audit Committee	Board Risk Committee	Brand Values and Conduct Committee	Governance and Nomination Committee	Board Financial Crime Risk Committee	Remuneration Committee

Group Risk Committee

- Group Non-Financial Risk Committee
- Group Financial Crime Risk Committee
- Group Information Management Governance Committee
- Stress Testing Committee
- IFRS 9 Impairment Committee
- Model Risk Committee
- Group Reputational Risk Committee
- Corporate, Commercial and Institutional Banking Risk Committee
- Private Banking Process Governance and Risk Committee
- Greater China & North Asia Risk Committee
- ASEAN & South Asia Risk Committee
- Africa and Middle East Risk Committee

Group Asset and Liability Committee

- Operational Balance Sheet Committee

Combined United States Operations Risk Committee

The committee governance structure ensures that risk-taking authority and risk management policies are cascaded down from the Board to the appropriate functional, client segment and country-level senior management and committees. Information regarding material risk issues and compliance with policies and standards is communicated to the appropriate country, client segment, functional and Group-level senior management and committees.

Further details on the role of the Board and its committees in matters of risk governance are covered in the Directors' report (pages 56 to 133)

Group Risk Committee

The Group Risk Committee is responsible for ensuring the effective management of risk throughout the Group in support of the Group's strategy. The Group Chief Risk Officer chairs the Group Risk Committee, whose members are drawn from the Group's Management Team. The Committee determines the ERMF for the Group, including the delegation of any part of its authorities to appropriate individuals or properly constituted sub-committees.

The Committee requests and receives relevant information to fulfil its governance mandates relating to the risks to which the Group is exposed. As with the Board Risk Committee, the Group Risk Committee and Group Asset and Liability Committee receive reports that include information on risk measures, Risk Appetite metrics and thresholds, risk concentrations, forward-looking assessments, updates on specific risk situations and actions agreed by these committees to reduce or manage risk.

Group Risk Committee sub-committees

The Group Non-Financial Risk Committee, chaired by the Group Head, Operational Risk, was established in 2018 to replace the Group Operational Risk Committee and ensures effective management of inherent non-financial principal risks throughout the Group. The non-financial Principal Risk Types in scope governed under the Group Non-Financial Risk Committee are Operational Risk, Compliance Risk, Conduct Risk, Information and Cyber Security Risk and Reputational Risk that is consequential in nature arising from the failure of all other principal risks (secondary Reputational Risk). The Committee also reviews and challenges the adequacy of the internal control systems across all Principal Risk Types.

The Group Financial Crime Risk Committee, chaired by the Group Head, CFCC, provides oversight of the effectiveness of the Group's policies, procedures, systems, controls and assurance arrangements designed to identify, assess, manage, monitor, prevent and/or detect money laundering, non-compliance with sanctions, bribery, corruption and tax crime by third parties.

The Group Information Management Governance Committee, chaired by the Group Chief Information Officer, ensures that the Group has an effective strategy and approach for data quality management framework, and that priorities, standards and metrics are in place and maintained taking into account the information-related requirements of internal and external stakeholders.

The Stress Testing Committee, chaired by the Global Head, Enterprise Risk Management, ensures the effective management of capital and liquidity-related enterprise stress testing in line with the Group's enterprise stress testing policy and applicable regulatory requirements. In addition, the Committee approves and provides oversight over stress testing models pertaining to Credit Risk, Traded Risk, Liquidity Risk and valuation models.

The IFRS 9 Impairment Committee, chaired by the Global Head, Enterprise Risk Management, ensures the effective management of expected credit loss computation as well as stage allocation of financial assets for quarterly financial reporting within the authorities set by the Group Risk Committee.

The Model Risk Committee, chaired by the Global Head, Enterprise Risk Management, ensures the effective measurement and management of model risk in support of the Group's strategy. The Committee also defines and approves the Group's model Risk Appetite, approves the Group's most material models and monitors the Group's model landscape and risk profile against the model Risk Appetite.

The Group Reputational Risk Committee, chaired by the Group Head, CFCC, oversees the effective management of Reputational Risk across the Group, including risks arising from decisions related to clients, products, transactions or pursuit of strategy at the time of decision-making (primary Reputational risk) and secondary Reputational Risk. The Committee takes decisions on material and thematic Reputational Risk issues.

The Corporate, Commercial & Institutional Banking Risk Committee (CCIBRC) covers risks arising from the Group's activities in Corporate & Institutional Banking and Commercial Banking globally and in the Europe & Americas region as well as Group-wide Traded risk, including oversight for Treasury Markets. The CCIBRC is chaired by the Chief Risk Officer, Corporate & Institutional Banking.

The Private Banking Process Governance and Risk Committee covers risks arising from the Group's activities in Private Banking and Wealth Management globally. It is jointly chaired by the Chief Risk Officer, Commercial Banking and Private Banking and the Global Head, Private Banking and Wealth Management.

The three regional risk committees, chaired by the Chief Risk Officer for each respective region, cover risks arising from their respective regions.

Group Asset and Liability Committee

The Group Asset and Liability Committee is chaired by the Group Chief Financial Officer. Its members are drawn principally from the Management Team. The Committee is responsible for determining the Group's approach to balance sheet management and ensuring that, in executing the Group's strategy, the Group operates within internally approved Risk Appetite and external requirements relating to capital, liquidity and leverage risk. It is also responsible for policies relating to balance sheet management, including management of our liquidity and capital adequacy, structural foreign exchange, interest rate and tax exposure.

Combined United States Operations Risk Committee

The Combined United States Operations Risk Committee was established in 2016 to comply with the Dodd-Frank Act section 165 Enhanced Prudential Standards (EPS Rules). The EPS Rules legislated a number of enhanced obligations on the US operations commensurate with its structure, risk profile, complexity, activities and size. The Committee receives its authority from the Standard Chartered Bank Court and is chaired by the Group Chief Risk Officer with membership drawn from the Standard Chartered Bank Court and one Independent Non-Executive Director of Standard Chartered PLC. Its responsibilities are drawn from the EPS Rules and pertain to liquidity, risk governance and oversight.

Principal risks

We manage and control our Principal Risk Types through distinct Risk Type Frameworks, policies and Board-approved Risk Appetite.

Credit Risk

The Group defines Credit Risk as the potential for loss due to the failure of a counterparty to meet its agreed obligations to pay the Group

Risk Appetite Statement

The Group manages its credit exposures following the principle of diversification across products, geographies, client segments and industry sectors

Roles and responsibilities

The Credit Risk Type Frameworks for the Group are set and owned by the Chief Risk Officers for the Corporate & Institutional Banking, Commercial Banking, Private Banking, and Retail Banking segments. The Credit Risk function is the second line control function responsible for independent challenge, monitoring and oversight of the Credit risk management practices of the business and functions engaged in or supporting revenue-generating activities, which constitute the first line of defence. In addition, to ensure that credit risks are properly assessed and are transparent, credit decisions are controlled in accordance with the Group's Risk Appetite and credit policies and standards.

Credit policies and standards are established and approved by the Credit Risk Type Framework owners or by individuals with delegated authorities. Segment specific policies are in place for the management of Credit risk. For Corporate & Institutional Banking and Commercial Banking, policies address large exposures, credit initiation, approval, monitoring, credit grading and documentation. For Retail Banking, policies address management of retail and business banking lending, account and portfolio monitoring, collections management and forbearance programmes. In addition, there are other Group-wide policies integral to Credit Risk management such as those relating to stress testing, risk measurement and impairment provisioning.

Mitigation

The Group credit policies set out the key considerations for eligibility, enforceability and effectiveness of Credit Risk mitigation arrangements. Potential credit losses from any given account, client or portfolio are mitigated using a range of tools such as collateral, netting agreements, credit insurance, credit derivatives and guarantees. The reliance that can be placed on risk mitigants is carefully assessed in light of issues such as legal certainty and enforceability, market valuation, correlation and counterparty risk of the protection provider. The requirement for risk mitigation is not a substitute for the ability to pay, which is the primary consideration for any lending decision.

Collateral types that are eligible as risk mitigants include: cash; accounts receivable; residential, commercial and industrial property; fixed assets such as motor vehicles, aircraft, plant and machinery; marketable securities; commodities; risk participations; guarantees; derivatives; credit insurance; and standby letters of credit. Physical collateral, such as property, fixed assets and commodities, and financial collateral must be independently valued and an active secondary resale market must exist. The collateral must be valued prior to drawdown and regularly thereafter as required to reflect current market conditions, the probability of recovery and the period of time to realise the collateral in the event of liquidation. Stress tests are performed on changes in collateral values for key portfolios to assist senior management in managing the risks in those portfolios. The Group also seeks to diversify its collateral holdings across asset classes and markets.

Documentation must be held to enable the Group to realise the collateral without the cooperation of the obligor in the event that this is necessary. For certain types of lending, typically mortgages or asset financing where a first charge over the risk mitigant must be attained, the right to take charge over physical assets is significant in terms of determining appropriate pricing and recoverability in the event of default. Physical collateral is required to be insured at all times against risk of physical loss or damage.

Where guarantees, credit insurance, standby letters of credit or credit derivatives are used as Credit Risk mitigation, the creditworthiness of the protection provider is assessed and monitored using the same credit approval process applied to the obligor. The main types of guarantors include banks, insurance companies, parent companies, governments and export credit agencies.

Governance committee oversight

At the Board level, the Board Risk Committee oversees the effective management of Credit Risk.

At the executive level, the Group Risk Committee appoints sub-committees for the management of Credit Risk – in particular the CCIBRC, the Private Banking Process Governance and Risk Committee, and the regional risk committees for Greater China & North Asia, ASEAN & South Asia and Africa & Middle East. These committees are responsible for overseeing the Credit Risk profile of the Group within the respective business areas and regions. Meetings are held regularly and the committees monitor all material Credit Risk exposures, as well as key internal developments and external trends, and ensure that appropriate action is taken.

The Group Risk Committee appoints sub-committees for effective management of enterprise stress testing, model governance for Credit Risk, and approval of impairment provisions computed under the IFRS 9 expected credit loss model to the Stress Testing Committee, the Model Risk Committee and the IFRS 9 Impairment Committee respectively.

Decision-making authorities and delegation

The Credit Risk Type Frameworks are the formal mechanism which delegate Credit Risk authorities to individuals such as the Group Chief Risk Officer, the segments' Chief Risk Officers and Global Heads of Risks based on their abilities and management responsibilities. Named individuals further delegate credit authorities to individual credit officers by applying delegated credit authority matrices by customer type or portfolio. These matrices establish the maximum limits that the delegated credit officers are authorised to approve, based on risk-adjusted scales which take into account the estimated maximum expected loss from a given customer or portfolio. Credit Risk authorities are reviewed at least annually to ensure they remain appropriate. In Corporate & Institutional Banking, Commercial Banking and Private Banking, the individuals delegating the Credit Risk authorities perform oversight by reviewing a sample of the limit applications approved by the delegated credit officers on a monthly basis. In Retail Banking, credit decision systems and tools (e.g. application scorecards) are used for credit decisioning. Where manual credit decisions are applied, these are subject to periodic quality control assessment and assurance checks.

All credit proposals are subject to a robust Credit Risk assessment. It includes a comprehensive evaluation of the client's credit quality, including willingness, ability and capacity to repay. The primary lending consideration is based on the client's credit quality and the repayment capacity from operating cashflows for counterparties; and personal income or wealth for individual borrowers. The risk assessment gives due consideration to the client's liquidity and leverage position. Where applicable, the assessment includes a detailed analysis of the Credit Risk mitigation arrangements to determine the level of reliance on such arrangements as the secondary source of repayment in the event of a significant deterioration in a client's credit quality leading to default. Lending activities that are considered as higher risk or non-standard are subject to stricter minimum requirements and require escalation to a senior credit officer or authorised senior executives for approval.

Monitoring

We regularly monitor credit exposures, portfolio performance, and external trends that may impact risk management outcomes. Internal risk management reports that are presented to risk committees contain information on key political and economic trends across major portfolios and countries; portfolio delinquency and loan impairment performance.

Credit Risk committees meet regularly to assess the impact of external events and trends on the Group's Credit Risk portfolios and to define and implement our response in terms of the appropriate changes to portfolio shape, underwriting standards, risk policy and procedures.

In Corporate & Institutional Banking and Commercial Banking, clients or portfolios are subjected to additional review when they display signs of actual or potential weakness; for example, where there is a decline in the client's position within the industry, financial deterioration, a breach of covenants, non-performance of an obligation within the stipulated period, or there are concerns relating to ownership or management. Such accounts and portfolios are subjected to a dedicated process overseen by the Credit Issues Committees in the relevant countries where client account strategies and credit grades are re-evaluated. In addition, remedial actions are agreed and monitored. Remedial actions include, but are not limited to, exposure reduction, security enhancement, exiting the account or immediate movement of the account into the control of Group Special Assets Management (GSAM), which is our specialist recovery unit for Corporate & Institutional Banking, Commercial Banking and Private Banking that operates independently from our main business.

For Retail Banking exposures, portfolio delinquency trends are monitored on an ongoing basis. Account monitoring is based on behaviour scores and bureau performance (where available). Accounts that are past due (or perceived as high risk and not yet past due) are subject to a collections or recovery process managed by a specialist function independent from the origination function. In some countries, aspects of collections and recovery activities are outsourced.

Credit rating and measurement

Risk measurement plays a central role, along with judgement and experience, in informing risk-taking and portfolio management decisions. Since 1 January 2008, we have used the advanced internal ratings-based approach under the Basel regulatory framework to calculate Credit Risk capital requirements.

A standard alphanumeric Credit Risk grade system is used for Corporate & Institutional Banking and Commercial Banking. The numeric grades run from 1 to 14 and some of the grades are further sub-classified. Lower numeric credit grades are indicative of a lower likelihood of default. Credit Grades 1 to 12 are assigned to performing customers, while Credit Grades 13 and 14 are assigned to non-performing or defaulted customers.

Retail Banking internal ratings-based portfolios use application and behavioural credit scores that are calibrated to generate a probability of default and then mapped to the standard alphanumeric Credit Risk grade system. We refer to external ratings from credit bureaus (where these are available); however, we do not rely solely on these to determine Retail Banking credit grades.

Advanced internal ratings-based models cover a substantial majority of our exposures and are used in assessing risks at a customer and portfolio level, setting strategy and optimising our risk-return decisions. Material internal ratings-based risk measurement models are approved by the Model Risk Committee. Prior to review and approval, all internal ratings-based models are validated in detail by a model validation team which is separate from the teams that develop and maintain the models. Models undergo annual validation by the model validation team. Reviews are also triggered if the performance of a model deteriorates materially against predetermined thresholds during the ongoing model performance monitoring process which takes place between the annual validations.

Credit concentration risk

Credit concentration risk may arise from a single large exposure to a counterparty or a group of connected counterparties, or from multiple exposures across the portfolio that are closely correlated. Large exposure concentration risk is managed through concentration limits set for a counterparty or a group of connected counterparties based on control and economic dependence criteria. Risk Appetite metrics are set at portfolio level and monitored to control concentrations, where appropriate, by industry, specific products, tenor, collateralisation level, top 20 concentration and exposure to holding companies. Single name credit concentration thresholds are set by client group depending on credit grade, and by customer segment. For concentrations that are material at a Group level, breaches and potential breaches are monitored by the respective governance committees and reported to the Group Risk and Board Risk Committees.

Credit impairment

Effective from 1 January 2018, we have adopted the impairment requirements of IFRS 9 Financial Instruments, where expected credit losses are determined for all financial assets that are classified as amortised cost or fair value through other comprehensive income. Expected credit losses are computed as an unbiased, probability-weighted amount determined by evaluating a range of plausible outcomes, the time value of money, and considering all reasonable and supportable information including that which is forward-looking. When determining forward looking expected credit losses, the Group also considers a set of critical global or country-specific macroeconomic variables that influence Credit Risk. Global macroeconomic variables include commodity prices such as crude oil, commodity indices, bond indices and others such as aircraft prices. Country-specific macroeconomic variables include foreign exchange rates, interest rates, fiscal indicators like government spending and government debt, country economic indicators such as real GDP, unemployment rate and consumer price indices, and property indicators like residential property indices.

At the time of origination or purchase of a non-credit-impaired financial asset (stage 1), expected credit losses represent cash shortfalls arising from possible default events up to 12 months into the future from the balance sheet date. Expected credit losses continue to be determined on this basis until there is a significant increase in the Credit Risk of the asset (stage 2), in which case, an expected credit loss provision is recognised for default events that may occur over the lifetime of the asset. If there is observed objective evidence of credit impairment or default (stage 3), expected credit losses continue to be measured on a lifetime basis.

The Group's definition of default is aligned with the regulatory definition of default as set out in European Capital Requirements Regulation (CRR178) and related guidelines, where the obligor is at least 90 days past due in respect of principal and/or interest. A loan is considered past due (or delinquent), when the customer has failed to make a principal or interest payment in accordance with the loan contract. Financial assets are also considered to be credit-impaired where the obligors are unlikely to pay on the occurrence of one or more observable events that have a detrimental impact on the estimated future cash flows of the financial asset.

In Corporate & Institutional Banking, Commercial Banking and Private Banking, a loan is considered credit-impaired where analysis and review indicate that full payment of either interest or principal, including the timeliness of such payment, is questionable, or as soon as payment of interest or principal is 90 days overdue. These credit-impaired accounts are managed by our specialist recovery unit (GSAM).

In Retail Banking, a loan is considered credit-impaired as soon as payment of interest or principal is 90 days overdue or meets other objective evidence of impairment such as bankruptcy, debt restructuring, fraud or death.

Financial assets are written off when there is no realistic prospect of recovery and the amount of loss has been determined. For Retail Banking assets, a financial asset is written off when it meets certain threshold conditions which are set at the point where empirical evidence suggests that the client is unlikely to meet their contractual obligations, or a loss of principal is expected.

Estimating the amount and timing of future recoveries involves significant judgement, and considers the assessment of matters such as future economic conditions and the value of collateral, for which there may not be a readily accessible market. The total amount of the Group's impairment provision is inherently uncertain, being sensitive to changes in economic and credit conditions across the regions in which the Group operates. For more details on sensitivity analysis of expected credit losses under IFRS 9, please refer to page 177.

Stress testing

Stress testing is a forward-looking risk management tool that constitutes a key input into the identification, monitoring and mitigation of Credit Risk, as well as contributing to Risk Appetite calibration. Periodic stress tests are performed on the credit portfolio/segment to anticipate vulnerabilities from stressed conditions and initiate timely right-sizing and mitigation plans. Additionally, multiple enterprise-wide and country-level stress tests are mandated by regulators to assess the ability of the Group and its subsidiaries to continue to meet their capital requirements during a plausible, adverse shock to the business. These regulatory stress tests are conducted in line with the principles stated in the Enterprise Stress Testing Policy. The Group's enterprise stress testing programme adopted IFRS 9 in full in 2018 and all enterprise stress tests conducted during 2018 were performed on an IFRS 9 basis. Stress tests for key portfolios are reviewed by the Credit Risk Type Framework owners (or delegates) as part of portfolio oversight; and matters considered material to the Group are escalated to the Group Chief Risk Officer and respective regional risk committees.

Country Risk

The Group defines Country Risk as the potential for losses due to political or economic events in a country

Risk Appetite Statement

The Group manages its country cross-border exposures following the principle of diversification across geographies and controls business activities in line with the level of jurisdiction risk

Roles and responsibilities

The Country Risk Type Framework provides clear accountability and roles for managing risk through the three lines of defence model. The Global Head, Enterprise Risk Management is responsible for the management and control of Country Risk across the Group and is supported by the Regional Chief Risk Officers and Country Chief Risk Officers who provide second line oversight and challenge to the first line Country Risk management activities. The first line ownership of Country Risk resides with the country CEOs who are responsible for the implementation of policy and allocation of approved Country Risk limits across relevant businesses and product lines, as well as the identification and measurement of Country Risks and communication of these and any non-compliance with policy or standards to the second line.

Mitigation

Standards are developed and deployed to implement requirements and controls that all countries must follow to ensure effective management of Country Risk. The standards outline the process for Country Risk limit setting, monitoring and reporting exposures. In response to growing concerns over the Country Risk outlook for a particular country, sovereign ratings may be downgraded and country limits may also be reduced.

Governance committee oversight

At the Board level, the Board Risk Committee oversees the effective management of Country Risk. At the executive level, the Group Risk Committee is responsible for approving policies and control risk parameters, monitoring material risk exposures and directing appropriate action in response to material risk issues or themes that come to the Committee's attention that relate to Country Risk. At a country level, the Country Risk Committee (or Executive Risk Committee for subsidiaries) is responsible for monitoring all risk issues for the respective country, including Country Risk.

Decision-making authorities and delegation

The Country Risk Type Framework is the formal mechanism through which the delegation of Country Risk authorities is made. Decision-making and approval authorities are guided by country capacity levels, which are guidelines to set country limits in respect of Country Risk. The capacity levels are assessed by the Group Country Risk function and are derived from factors including: Group Tier 1 capital, transfer risk grade, Group strategy, portfolio composition (short and medium-term) and each country's total foreign currency earnings.

Monitoring

Monitoring and reporting of Country Risk is included in the standards and covers the monitoring of exposures relative to Risk Appetite thresholds and limits, as well as the reporting of material exposures to internal committees and externally where appropriate. The Group Risk Committee monitors Risk Appetite thresholds on a traffic-light indicator basis, and these provide an early warning signal of stress and concentration risk. An escalation process to the Board Risk Committee is in place based on the traffic-light indicators monitoring system. In addition, the Group Risk Committee and the Board Risk Committee receive regular reports on Country Risk exposures in excess of 1 per cent of total Group assets.

Stress testing

The Group Country Risk team produces stressed Sovereign ratings which are used by the relevant Credit and Traded Risk teams in calculating risk-weighted assets during described extreme but plausible stress scenarios.

Traded Risk

The Group defines Traded Risk as the potential for loss resulting from activities undertaken by the Group in financial markets

Risk Appetite Statement

The Group should control its trading portfolio and activities to ensure that Traded Risk losses (financial or reputational) do not cause material damage to the Group's franchise

Under the Enterprise Risk Management Framework, the introduction of the Traded Risk Type Framework (TRTF) in 2018 sought to bring together all risk types exhibiting risk features common to Traded Risk.

These risk types include Market Risk, Counterparty Credit Risk, Issuer Risk, XVA, Algorithmic Trading and Pension Risk. Traded Risk Management (TRM, formerly Market and Traded Credit Risk) is the core risk management function supporting market-facing businesses, specifically Financial Markets and Treasury Markets.

Roles and responsibilities

The TRTF, which sets the roles and responsibilities in respect of Traded Risk for the Group, is owned by the Global Head, Traded Risk Management. The front office, acting as first line of defence, are responsible for the effective management of risks within the scope of its direct organisational responsibilities set by the Board. The TRM function is the second line control function that performs independent challenge, monitoring and oversight of the Traded Risk management practices of the first line of defence. The first and second lines of defence are supported by the organisation structure, job descriptions and authorities delegated by Traded Risk control owners.

Mitigation

The Group controls its trading portfolio and activities to ensure that Traded Risk losses (financial or reputational) do not cause material damage to the Group's franchise by assessing the various Traded Risk factors. These are captured and analysed using proprietary and custom-built analytical tools, in addition to risk managers' specialist market and product knowledge.

TRM has a framework, policies and standards in place ensuring that appropriate Traded Risk limits are implemented. The Group's Traded Risk exposure is aligned with its appetite for Traded Risk, and assessment of potential losses that might be incurred by the Group as a consequence of extreme but plausible events.

Traded Risk limits are applied as required by the TRTF and related standards. All businesses incurring Traded risk must do so in compliance with the TRTF. The TRTF requires that Traded Risk limits are defined at a level appropriate to ensure that the Group remains within Traded Risk Appetite. All exposures throughout the Group that the TRM function is responsible for aggregate up to TRM's Group-level reporting. This aggregation approach ensures that the limits structure across the Group is consistent with the Group's Risk Appetite.

The TRTF and Enterprise Stress Testing Policy ensure that adherence to stress-related Risk Appetite metrics is achieved. Stress testing aims at supplementing other risk metrics used within the Group by providing a forward-looking view of positions and an assessment of their resilience to stressed market conditions. Stress testing is performed on all Group businesses with Traded risk exposures, either where the risk is actively traded or where material risk remains. This additional information is used to inform the management of the Traded risks taken within the Group. The outcome of stress tests is discussed across the various business lines and management levels so that existing and potential risks can be reviewed, and related management actions can be decided upon where appropriate.

Policies are reviewed and approved by the Global Head, TRM annually to ensure their ongoing effectiveness and sustainability.

Governance committee oversight

At the Board level, the Board Risk Committee oversees the effective management of Traded Risk. At the executive level, the Group Risk Committee delegates responsibilities to the CCIBRC to act as the primary risk governance body for Traded Risk, and to the Stress Testing Committee for stress testing and the Model Risk Committee for model risk.

Decision-making authorities and delegation

The Group's Risk Appetite Statement, along with the key associated Risk Appetite metrics, is approved by the Board with responsibility for Traded Risk limits, then tiered accordingly.

Subject to the Group's Risk Appetite for Traded Risk, the Group Risk Committee sets Group-level Traded Risk limits, via delegation to the GCRO. The GCRO delegates authority for the supervision of major business limits to the CRO, Corporate & Institutional Banking and for all other Traded Risk limits to the TRTF Owner (Global Head, TRM) who in turn delegates approval authorities to individual Traded Risk managers.

Additional limits are placed on specific instruments, positions, and portfolio concentrations where appropriate. Authorities are reviewed at least annually to ensure they remain appropriate and to assess the quality of decisions taken by the authorised person. Key risk-taking decisions are made only by certain individuals with the skills, judgement and perspective to ensure that the Group's control standards and risk-return objectives are met. Authority delegators are responsible for monitoring the quality of the risk decisions taken by their delegates and the ongoing suitability of their authorities.

Market Risk – Value at Risk

The Group applies VaR as a measure of the risk of losses arising from future potential adverse movements in market rates, prices and volatilities. VaR, in general, is a quantitative measure of Market Risk that applies recent historical market conditions to estimate the potential future loss in market value that will not be exceeded in a set time period at a set statistical confidence level. VaR provides a consistent measure that can be applied across trading businesses and products over time and can be set against actual daily trading profit and loss outcomes.

VaR is calculated for expected movements over a minimum of one business day and to a confidence level of 97.5 per cent. VaR is calculated on our exposure as at the close of business, generally UK time. Intra-day risk levels may vary from those reported at the end of the day.

The Group applies two VaR methodologies:

- Historical simulation: this involves the revaluation of all existing positions to reflect the effect of historically observed changes in Market Risk factors on the valuation of the current portfolio. This approach is applied for general Market Risk factors and the majority of specific (credit spread) risk VaRs
- Monte Carlo simulation: this methodology is similar to historical simulation but with considerably more input risk factor observations. These are generated by random sampling techniques, but the results retain the essential variability and correlations of historically observed risk factor changes. This approach is applied for some of the specific (credit spread) risk VaR in relation to idiosyncratic exposures in credit markets

In both methods, a historical observation period of one year is chosen and applied.

A small proportion of Market Risk generated by trading positions is not included in VaR or cannot be appropriately captured by VaR. This is recognised through a Risks-not-in-VaR Framework, which estimates these risks and applies capital add-ons.

To assess their ongoing performance, VaR models are backtested against actual results.

An analysis of VaR and backtesting results in 2018 is available in the Risk profile section (pages 180 to 183).

Counterparty Credit Risk

Credit Risk from traded products derives from the positive mark-to market value of the underlying instruments, and an additional component to cater for potential future market movements. This Counterparty Credit Risk is managed within the Group's overall credit Risk Appetite for corporate and financial institutions. In addition to analysing potential future movements, the Group uses various single factor or multi-risk factor stress test scenarios to identify and manage Counterparty Credit Risk across derivatives and securities financing transactions.

Underwriting

The limits for the underwriting of securities to be held for sale are approved by the Underwriting Committee, under the authority of the CCIBRC. The limits include the overall size of the securities inventory, the maximum holding period, the daily VaR, and sensitivities to interest rate and credit spread moves. The Underwriting Committee approves individual proposals to underwrite new security issues for our clients.

Day-to-day Credit Risk management activities for traded securities are carried out by a specialist team within TRM whose activities include oversight and approval within the levels delegated by the Underwriting Committee. Issuer credit risk, including settlement and pre-settlement risk, and price risks are controlled by TRM. Where an underwritten security is held for a period longer than the target sell-down period, the final decision on whether to sell the position rests with TRM.

Monitoring

TRM monitors the overall portfolio risk and ensures that it is within specified limits and therefore Risk Appetite. The annual and mid-year limit review processes provide opportunities for the business and TRM to review risk in light of performance.

Traded Risk exposures are monitored daily against approved limits. Intra-day risk exposures may vary from those reported at the end of the day. Limit excess approval decisions are informed by factors such as an assessment of the returns that will result from an incremental increase to the business risk exposure. Limits and excesses can only be approved by a Traded Risk manager with the appropriate delegated authority. Financial Markets traders may adjust their Traded Risk exposures within approved limits and assess risk and reward trade-offs according to market conditions.

TRM reports and monitors limits applied to stressed exposures. Stress scenario analysis is performed on all Traded Risk exposures in Financial Markets and in portfolios outside Financial Markets such as syndicated loans and principal finance. Stress loss excesses are discussed with the business and approved where appropriate based on delegated authority levels.

Stress testing

The VaR measurement is complemented by weekly stress testing of Market Risk exposures to highlight the potential risk that may arise from extreme market events that are deemed rare but plausible.

Stress testing is an integral part of the Traded Risk management framework and considers both historical market events and forward-looking scenarios. A consistent stress testing methodology is applied to trading and non-trading books. The stress testing methodology assumes that scope for management action would be limited during a stress event, reflecting the decrease in market liquidity that often occurs.

Stress scenarios are regularly updated to reflect changes in risk profile and economic events. The TRM function reviews stress testing results and, where necessary, enforces reductions in overall Market Risk exposure. The Group Risk Committee considers the results of stress tests as part of its supervision of Risk Appetite.

Regular stress test scenarios are applied to interest rates, credit spreads, exchange rates, commodity prices and equity prices. This covers all asset classes in the Financial Markets banking and trading books, including XVA (CVA and FVA). Ad hoc scenarios are also prepared, reflecting specific market conditions and for particular concentrations of risk that arise within the business. Where required by local statute or regulation, TRM's Group and business-wide stress and scenario testing will be supplemented by entity stress testing at a country level. This stress testing is coordinated at the country level and subject to the relevant local governance.

Capital and Liquidity Risk

The Group defines Capital Risk as the potential for insufficient level, composition or distribution of capital to support our normal activities, and Liquidity Risk as the risk that we may not have sufficient stable or diverse sources of funding to meet our obligations as they fall due

Risk Appetite Statement

The Group should maintain a strong capital position including the maintenance of management buffers sufficient to support its strategic aims and hold an adequate buffer of high-quality liquid assets to survive extreme but plausible liquidity stress scenarios for at least 60 days without recourse to extraordinary central bank support

Roles and responsibilities

The Treasurer is responsible for developing a risk type framework for Capital and Liquidity Risk and for complying with regulatory requirements at a Group level. The Treasury and Finance functions, as the Second Line of Defence, provide independent challenge and oversight of the first line risk management activities relating to Capital and Liquidity Risk. In country, the Treasurer is supported by Treasury and Finance in implementing the Capital and Liquidity Risk Type Framework.

Mitigation

The Group develops policies to address material Capital and Liquidity risks and aims to maintain its risk profile within Risk Appetite. Risk Appetite is set for the Group and cascaded down to the countries in the form of limits and management action triggers. The Group also maintains a Recovery Plan which is a live document to be used by management in a liquidity or solvency stress. The Recovery Plan includes a set of Recovery Indicators, an escalation framework and a set of management actions capable of being implemented in a stress. A Recovery Plan is also maintained within each major country.

The approach to mitigation is detailed further below.

Capital planning

On an annual basis, strategic business and capital plans are drawn up covering a five-year horizon, and are approved by the Board. The capital plan ensures that adequate levels of capital, including loss absorbing capacity, and an efficient mix of the different components of capital are maintained to support our strategy and business plans. Treasury is responsible for the ongoing assessment of the demand for capital and the updating of the Group's capital plan.

Capital planning takes the following into account:

- Current regulatory capital requirements and our assessment of future standards and how these might change
- Demand for capital due to the business and loan impairment outlook and potential market shocks or stresses
- Available supply of capital and capital raising options, including ongoing capital accretion from the business

Structural FX risk

The Group's structural position results from the Group's non-US dollar investment in the share capital and reserves of subsidiaries and branches. The FX translation gains or losses are recorded in the Group's Translation Reserves with a direct impact on the Group's CET1 ratio.

The Group contracts hedges to manage its structural FX position in accordance with a Board-approved Risk Appetite, and as a result the Group has taken net investment hedges to partly cover its exposure to the Korean won, Chinese renminbi, Taiwanese dollar and Indian rupee to mitigate the FX impact of such positions on its capital ratios.

Liquidity Risk

At Group and country level we implement various business-as-usual and stress risk metrics and monitor these against limits and management action triggers. This ensures that the Group maintains an adequate and well-diversified liquidity buffer as well as a stable funding base. A funding plan is also developed for efficient liquidity projection to ensure that the Group is adequately funded, in the required currencies, to meet its obligations and client funding needs. The approach to managing the risks and the Board Risk Appetite is assessed annually through the Internal Liquidity Adequacy Assessment Process.

Interest rate risk in banking book

The Group defines interest rate risk in the banking book (IRRBB) as the potential for a reduction in future earnings or economic value due to changes in interest rates. This risk arises from differences in the re-pricing profile, interest rate basis, and optionality of banking book assets, liabilities and off-balance sheet items. The Group monitors IRRBB against a Board-approved Risk Appetite.

Governance committee oversight

At the Board level, the Board Risk Committee oversees the effective management of Capital and Liquidity Risk. At the executive level, the Group Asset and Liability Committee ensures the effective management of risk throughout the Group in support of the Group's strategy, and guides the Group's strategy on balance sheet optimisation and ensures that the Group operates within the internally approved Risk Appetite, as well as other external and internal capital and liquidity requirements. The Group Asset and Liability Committee delegates part of this responsibility to the Operational Balance Sheet Committee to ensure alignment with business objectives.

Country oversight under the capital and liquidity framework resides with country Asset and Liability Committees. Countries must ensure that they remain in compliance with Group capital and liquidity policies and practices, as well as local regulatory requirements.

The Stress Testing Committee ensures the effective management of capital and liquidity-related enterprise stress testing in line with the Group's Enterprise Stress Testing Policy and applicable regulatory requirements. The Stress Testing Committee reviews, challenges and approves stress scenarios, results and management actions for all enterprise stress tests. Insights gained from the stress tests are used to inform underwriting decisions, risk management, capital and liquidity planning and strategy.

Decision-making authorities and delegation

The Group Chief Financial Officer has responsibility for capital, funding and liquidity under the Senior Managers Regime. The Group Chief Financial Officer and Group Chief Risk Officer have delegated the Risk Framework Owner responsibilities associated with Capital and Liquidity Risk to the Treasurer. The Treasurer delegates second line oversight and challenge responsibilities to relevant and suitably qualified Treasury and Finance individuals.

Monitoring

On a day-to-day basis, the management of Capital and Liquidity Risk is performed by the country Chief Executive Officer and Treasury Markets respectively. The Group regularly reports and monitors capital and liquidity risks inherent in its business activities and those that arise from internal and external events. The management of capital and liquidity is monitored by Treasury and Finance with appropriate escalation processes in place.

Internal risk management reports covering the balance sheet and the capital and liquidity position of the Group are presented to the Operational Balance Sheet Committee and the Group Asset and Liability Committee. The reports contain key information on balance sheet trends, exposures against Risk Appetite and supporting risk measures which enable members to make informed decisions around the overall management of the Group's balance sheet. Oversight at a country level is provided by the country Asset and Liability Committee, with a focus on the local capital and liquidity risks, local prudential requirements and risks that arise from local internal and external events.

Stress testing

Stress testing and scenario analysis are an integral part of the capital and liquidity framework, and are used to ensure that the Group's internal assessment of capital and liquidity considers the impact of extreme but plausible scenarios on its risk profile. They provide an insight into the potential impact of significant adverse events on the Group's capital and liquidity position and how this could be mitigated through appropriate management actions to ensure the Group remains within the approved Risk Appetite and regulatory limits.

Operational Risk

The Group defines Operational Risk as the potential for loss resulting from inadequate or failed internal processes and systems, human error, or from the impact of external events (including legal risks)

Risk Appetite Statement

The Group aims to control operational risks to ensure that operational losses (financial or reputational), including any related to conduct of business matters, do not cause material damage to the Group's franchise

Roles and responsibilities

The Operational Risk Type Framework (ORTF) is set by the Group Head, Operational Risk and is applicable enterprise-wide. This Framework defines and collectively groups operational risks which have not been classified as Principal Risk Types into non-Principal Risk Types (non-PRTs) and sets standards for the identification, control, monitoring and treatment of risks. These standards are applicable across all PRTs and non-PRTs. The non-PRTs relate to execution capability, fraud, corporate governance, reporting and obligations, model, safety and security, legal enforceability, and operational resilience (including client service, third party vendor services, change management, and system availability).

The ORTF reinforces clear accountability for managing risk throughout the Group and delegates second line of defence responsibilities to identified subject matter experts. For each non-PRT, the expert sets policies for the organisation to comply with, and provides guidance, oversight and challenge over the activities of the Group. They ensure that key risk decisions are only taken by individuals with the requisite skills, judgement, and perspective to ensure that the Group's risk/return objectives are met.

Mitigation

The ORTF sets out the Group's overall approach to the management of Operational Risk in line with the Group's Operational Risk Appetite. This is supported by Control Assessment Standards (CAS) which define roles and responsibilities for the identification, control and monitoring of risks (applicable to all non-PRTs and PRTs).

The CAS are used to determine the design strength and reliability of each process, and require:

- The recording of processes run by client segments, products, and functions into a process universe
- The identification of potential breakdowns to these processes and the related risks of such breakdowns
- An assessment of the impact of the identified risks based on a consistent scale
- The design and monitoring of controls to mitigate prioritised risks
- Assessments of residual risk and prompt actions for elevated risks

Risks that exceed the Group's Operational Risk Appetite require treatment plans to address underlying causes.

Governance committee oversight

At the Board level, the Board Risk Committee oversees the effective management of Operational risk. At the executive level, the Group Risk Committee delegates authority primarily to the Group Non-Financial Risk Committee (GNFRC) to monitor the Group's Operational Risk Appetite and to oversee the Group's Operational risk profile. The GNFRC has the authority to challenge, constrain and, if required, stop business activities where risks are not aligned with the Group's Operational Risk Appetite.

Regional, business segments and functional-committees also provide enterprise oversight of their respective processes and related operational risks. In addition, Country Non-Financial Risk Committees (CNFRCs) oversee the management of Operational risks at the country (or entity) level. In smaller countries, the responsibilities of the CNFRC may be exercised directly by the Country Risk Committee (for Branches) or Executive Risk Committee (for Subsidiaries).

Monitoring

To deliver services to clients and to participate in the financial services sector, the Group runs processes which are exposed to operational risks. The Group prioritises and manages risks which are significant to clients and to the financial services sectors. Control indicators are regularly monitored to determine the residual risk the Group is exposed to. The residual risk assessments and reporting of events form the Group's Operational Risk profile. The completeness of the Operational Risk profile ensures appropriate prioritisation and timeliness of risk decisions, including risk acceptances with treatment plans for risks that exceed acceptable thresholds.

The Board is informed on adherence to Operational Risk Appetite through metrics reported for selected risks. These metrics are monitored and escalation thresholds are devised based on the materiality and significance of the risk. These Operational Risk Appetite metrics are consolidated on a regular basis and reported at relevant Group committees. This provides senior management with the relevant information to inform their risk decisions.

Stress testing

Stress testing and scenario analysis are used to assess capital requirements for operational risks. This approach considers the impact of extreme but plausible scenarios on the Group's Operational Risk profile. A number of scenarios have been identified to test the robustness of the Group's processes, and assess the potential impact on the Group. These scenarios include anti-money laundering, sanctions, information and cyber security and external fraud.

Reputational Risk

The Group defines Reputational Risk as the potential for damage to the franchise, resulting in loss of earnings or adverse impact on market capitalisation because of stakeholders taking a negative view of the organisation, its actions or inactions – leading stakeholders to change their behaviour

Risk Appetite Statement

The Group aims to protect the franchise from material damage to its reputation by ensuring that any business activity is satisfactorily assessed and managed by the appropriate level of management and governance oversight

Roles and responsibilities

The Global Head, Enterprise Risk Management is the Risk Framework Owner for Reputational Risk under the Group's Enterprise Risk Management Framework. For primary risks, the responsibility of Reputational Risk management at country level is delegated to Country Chief Risk Officers. Both the Global Head, Enterprise Risk Management and Country Chief Risk Officers constitute the second line of defence, overseeing and challenging the first line which resides with the Chief Executive Officers, Business Heads and Product Heads in respect of risk management activities of reputational-related risks. The Group recognises that there is also the potential for consequential Reputational Risk should it fail to control other Principal Risk Types. Such secondary reputational risks are managed by the Risk Framework Owners of each Principal Risk Type who are responsible for enhancing existing risk management frameworks to incorporate Reputational Risk management approaches.

Mitigation

The Group's Reputational Risk policy sets out the principal sources of Reputational Risk and the responsibilities and procedures for identifying, assessing and escalating primary and secondary reputational risks. The policy also defines the control and oversight standards to effectively manage Reputational Risk. The Group takes a structured approach to the assessment of risks associated with how individual client, transaction, product and strategic coverage decisions may affect perceptions of the organisation and its activities. Wherever a potential for stakeholder concerns is identified, issues are subject to prior approval by a management authority commensurate with the materiality of matters being considered. Such authorities may accept or decline the risk or impose conditions upon proposals, to protect the Group's reputation. Secondary Reputational Risk mitigation derives from the effective management of other Principal Risk Types.

Governance committee oversight

The Brand, Values and Conduct Committee retains Board-level oversight responsibility for Reputational Risk. Oversight from an operational perspective falls under the remit of the Group Risk Committee and the Board Risk Committee. The Group Reputational Risk Committee ensures the effective management of primary Reputational Risk across the Group.

The Group Reputational Risk Committee's remit is to:

- Challenge, constrain and, if required, stop business activities where risks are not aligned with the Group's Risk Appetite
- Make decisions on Reputational Risk matters assessed as high or very high based on the Group's primary Reputational Risk materiality assessment matrix, and matters escalated from the regions or client businesses
- Provide oversight of material Reputational Risk and/or thematic issues arising from the potential failure of other risk types

The Group Non-Financial Risk Committee has oversight of the effective management of secondary Reputational Risk.

Decision-making authorities and delegation

The Group Risk Committee provides Group-wide oversight on Reputational Risk, approves policy and monitors material risks. The Group Reputational Risk Committee is authorised to approve or decline Reputational Risk aspects of any business transaction, counterparty, client, product, line of business and market within the boundaries of the Group's Risk Appetite, and any limits and policies set by authorised bodies of the Group.

Monitoring

Reputational Risk policies and standards are applicable to all Group entities. However, local regulators in some markets may impose additional requirements on how banks manage and track Reputational Risk. In such cases, these are complied with in addition to Group policies and standards. Exposure to Reputational Risk is monitored through:

- A requirement that process owners establish triggers to prompt consideration of Reputational Risk and escalation where necessary
- The tracking of risk acceptance decisions
- The tracking of thematic trends in secondary risk arising from other Principal Risk Types
- The analysis of prevailing stakeholder concerns

Stress testing

Although Reputational Risk is not an explicit separate regulatory factor in enterprise stress tests, it is incorporated into the Group's stress testing scenarios. For example, the Group may consider what impact a hypothetical event leading to loss of confidence among liquidity providers in a particular market might have, or what the implications might be for supporting part of the organisation in order to protect the brand.

Compliance Risk

The Group defines Compliance Risk as potential for penalties or loss to the Group or for an adverse impact to our clients, stakeholders or to the integrity to markets we operate in through a failure on our part to comply with laws, or regulations

Risk Appetite Statement

The Group has no appetite for breaches in laws and regulations; while recognising that regulatory non-compliance cannot be entirely avoided, the Group strives to reduce this to an absolute minimum

Roles and responsibilities

The Group Head, Conduct, Financial Crime and Compliance (CFCC), as Risk Framework Owner for Compliance Risk provides support to senior management on regulatory and compliance matters by:

- Providing interpretation and advice on regulatory requirements and their impact on the Group;
- Setting enterprise-wide standards for compliance, through the establishment and maintenance of a risk-based compliance framework, the Compliance Risk Type Framework (Compliance RTF);
- Setting a programme for monitoring Compliance Risk

The Compliance RTF sets out the roles and responsibilities in respect of Compliance Risk for the Group. All activities that the Group engages in must be designed to comply with the applicable laws and regulations in the countries in which we operate. The CFCC function is the Second Line of Defence that ensures the overall operation of the framework and for significant areas of laws and regulations, provides oversight and challenge of the first line risk management activities that relate to Compliance Risk.

The Compliance RTF defines Compliance Risk sub-types and, where relevant, assigns responsibility for these to the most appropriate other Principal Risk Type Owner or control function. This ensures that effective oversight and challenge of the first line can be provided by the appropriate second line function. Each of these assigned second line functions sets policies for the organisation to comply with, and provides guidance, oversight, and challenge over the activities of the Bank. They ensure that key risk decisions are only taken by individuals with the requisite skills, judgement, and perspective to ensure that the Group's Compliance Risk is appropriately managed.

Mitigation

The Compliance RTF sets the Group's overall approach to the management of Compliance Risk. In support of this, the Compliance function develops and deploys relevant policies and standards setting out requirements and controls for adherence by the Group to ensure continued compliance with applicable laws and regulations. Through a combination of risk assessment, control standard setting, control monitoring and compliance review activities, the Compliance Risk Framework Owner seeks to ensure that all policies are operating as expected to mitigate the risk that they cover. The installation of appropriate processes and controls is the primary tool for the mitigation of Compliance Risk. In this, the requirements of the Operational Risk Type Framework are followed to ensure a consistent approach to the management of processes and controls.

Governance committee oversight

Compliance risk and the risk of non-compliance with laws and regulations resulting from failed processes and controls are overseen by Business, Product and Function Non-Financial Risk Committees. The Conduct and Compliance Non-Financial Risk Committee has a consolidated view of these risks, and ensures that appropriate governance is in place for these. In addition, the Committee ensures that elevated levels of Compliance risk are reported to the Group Non-Financial Risk Committee, Group Risk Committee and Board Audit Committee. Within each country, oversight of Compliance Risk is delegated through the Country Non-Financial Risk Committee where the Operational Risk Control Assessment Standards will form a primary part of the monitoring of Compliance Risk.

Decision-making authorities and delegation

Decision making and approval authorities follow the Enterprise Risk Management Framework approach and risk thresholds.

The Group Head, CFCC has the authority to delegate second line responsibilities within the CFCC function to relevant and suitably qualified individuals. In addition, second line responsibilities, including policy development, implementation and validation, as well as oversight and challenge of first line processes and controls are delegated based on the most appropriate other Principal Risk Type or control function for certain compliance risk sub-types.

Monitoring

The monitoring of controls designed to mitigate the risk of regulatory non-compliance in processes are governed in line with the Operational Risk Type Framework. The Group has a monitoring and reporting process in place for Compliance Risk, which includes the aggregation of compliance exposures from across the Group and escalation and reporting to Conduct and Compliance Non-Financial Risk Committee, Group Risk Committee and Board Risk Committee as appropriate. In addition, there is a Group Regulatory Reform team set up to monitor regulatory reforms in key markets and establish a protocol of horizon scanning for emerging Compliance Risk. This protocol ensures that regulatory reforms with the potential to affect the Group in multiple markets are identified and steps taken in good time to ensure compliance with these.

Stress testing

Stress testing and scenario analysis are used to assess capital requirements for Compliance Risk and form part of the overall scenario analysis portfolio managed under the Operational Risk Type Framework. Specific scenarios are developed annually with collaboration between the business who own and manage the risk and the CFCC function who are second line to incorporate significant Compliance risk tail events. This approach considers the impact of extreme but plausible scenarios on the Group's Compliance Risk profile.

Conduct Risk

The Group defines Conduct Risk as the risk of detriment to the Group's customers and clients, investors, shareholders, market integrity, competition and counterparties or from the inappropriate supply of financial services, including instances of wilful or negligent misconduct

Risk Appetite Statement

The Group strives to maintain the standards in our Code of Conduct and outcomes of our Conduct Framework, by continuously demonstrating that we are doing the right thing in the way we do business

In addition to the Group's external stakeholders, Conduct Risk may also arise in respect to our behaviour towards each other as colleagues. The Group believes that everyone is entitled to a fair and safe working environment that is free from discrimination, exploitation, bullying, harassment or inappropriate language.

Roles and responsibilities

Conduct Risk management and abiding by the Group Code of Conduct is the responsibility of all employees across the organisation.

The first line of defence is required to ensure that potential conduct risks arising in the business, functions and countries are identified, assessed and managed appropriately. Senior management in the first line of defence are accountable for embedding the right culture relating to Conduct Risk. The CFCC function is the second line for Conduct Risk, and is responsible for providing independent guidance, oversight, and challenge to the first line, as well as setting the risk management standards that the first line must adhere to. The CFCC function owns the risk sub-types, and where relevant, they are delegated to other functions or Risk Framework Owners in the Group.

Conduct Plan

The Conduct Plan is a live document and must be kept regularly updated, including as and when there are potential or materialised conduct risks identified through other PRTs. Identified conduct risks and the corresponding mitigation should be monitored by relevant governance committees to ensure effective and timely resolution. The Conduct Plans should meet minimum standards as follows:

- Conduct Plans are owned by the management of each country, region, business and function within the Group. As the first line of defence, management is responsible to ensure that the Conduct Plans are regularly reviewed and updated
- The Compliance function as the second line of defence and Risk Framework Owner is responsible for challenging management on the quality and completeness of the plan, as well as the effectiveness and timeliness of the remediation strategy
- The Conduct Plans highlight the key conduct risks that are inherent to the processes and activities performed or impacted within a country, region, business or function
- The Group Conduct Management Principles, which highlight various conduct outcomes, should be used as a guide to help with the process of identifying relevant conduct risks
- For each of the risks identified, appropriate remediation action, enhancements to the control environment, responsible action owners and timeframes for resolution must be clearly recorded within the Conduct Plan
- Regular engagement should take place between owners of the Group and geographic Conduct Plans to ensure appropriate escalation and communications related to conduct risks and the mitigation strategy applied
- Conduct Plans also reflect Conduct Risks based on one-off projects, adverse trends from conduct management information, internal conduct incidents, deficiencies identified through internal assurance activities across the three lines of defence, emerging risks/trends and external developments

Governance committee oversight

The Board Risk Committee, Brand Values and Conduct Committee, Group Risk Committee, Group Non-Financial Risk Committee and the Compliance Regulatory Risk Committee are responsible for ensuring that the Group effectively manages its Conduct risk. As Risk Framework Owner for Conduct Risk, Group Head, CFCC sets reporting thresholds for escalation of Conduct Risk to the Conduct and Compliance Risk Committee, Group Non-Financial Risk Committee and Group Risk Committee. The Board Risk Committee and the Brand Values and Conduct Committee receive periodic reports on Conduct Risk assurance against businesses and functions.

Decision-making authorities and delegation

Conduct Risk challenge and acceptance authority is exercised by the Group Head, CFCC and delegated within the CFCC function as second line.

Monitoring and mitigation

The Compliance Assurance team perform assurance reviews to monitor Conduct Risk outcomes. In limited or special circumstances, a specific thematic conduct review may be performed. This may be considered in scenarios where countries or businesses have significant and potentially systemic Conduct Risk issues, which may warrant a more focused assessment of the end-to-end controls.

These reviews supplement other compliance activities from a Second Line of Defence perspective. These activities include compliance stakeholder representation and challenge at first line governance committees and conduct forums; surveillance activity – such as trade surveillance, e-communication surveillance, and sales and suitability surveillance; Control Room management – such as outside business interests, personal account dealing, and information walls; and validating or challenging the Group performance scorecard for conduct.

Stress testing

The assessment of Conduct Risk vulnerabilities under stressed conditions or extreme events with a low likelihood of occurring are carried out through enterprise stress testing. This is currently covered primarily through Operational Risk and Financial Crime driven stress scenarios.

Information and Cyber Security Risk

The Group defines Information and Cyber Security Risk as the potential for loss from a breach of confidentiality, integrity or availability of the Group's information systems and assets through cyber attack, insider activity, error or control failure

Risk Appetite Statement

The Group seeks to avoid risk and uncertainty for our critical information assets and systems and has a low appetite for material incidents affecting these or the wider operations and reputation of the Group

Roles and responsibilities

In 2018, the Group approved a Risk Type Framework (RTF) to formally set out the Group-wide strategy for managing Information and Cyber Security (ICS) Risk. The RTF has strengthened the role of the business for managing ICS Risk. As a result, through 2018 there has been significant expansion of first line responsibilities to ensure in-depth ownership and understanding of ICS Risk by the first line of defence.

The RTF defines the first line roles of Information Asset Owners, Information System Owners, and Information Custodians. information asset owners and Information System Owners are named individuals within each business who have accountability for classifying and managing risks to the information assets and systems they own respectively. Information Custodians are named individuals, typically within the Technology and Innovation (T&I) function, responsible for providing secure processing of information commensurate to the level specified by the Information Asset or Information System Owner. In addition, each business and region has recruited Heads of ICS to provide Information Asset and System Owners a centralised first line point of contact to ensure controls are embedded effectively and consistently across the Group. The business, alongside T&I Security Technology Services, is responsible for remediation activities to strengthen the Group's ICS Risk controls to protect against any new threats in an evolving environment.

The Chief Information Security Officer (CISO) has overall responsibility for strategy, governance and oversight of ICS Risk across the Group and operates as the second line of defence. The CISO defines policy for ICS Risk, overseeing and challenging the operational implementation of controls at the first line.

Mitigation

ICS Risk is managed through a structured ICS Policy Framework comprised of a risk assessment methodology and supporting policies, procedures and standards which are aligned to industry best practice models.

Information Asset Owners, Information System Owners, and Information Custodians are responsible for compliance with the ICS Policy Framework. This requires the first line to embed applicable ICS policy controls, and measure the performance of these controls with key indicators against thresholds set by the Board. Additional controls may be added by the business area to reflect any specific characteristics of the reporting area which may be relevant, depending on concurrence from the CISO.

The CISO function monitors compliance to the ICS Policy Framework through an assessment of each key control domain defined by the ICS RTF through the Risk profile report. Within the risk profile view, appropriate mitigating activity for each key control domain is identified, undertaken and reported against by the business.

All business units, group functions, countries and regions (Information Asset/System Owner and Information Custodians) complete a risk assessment of each relevant key control domain for their operational environment by completing a risk profile. These are submitted to the CISO and to relevant governance committees for continuous oversight and challenge against Risk Appetite requirements.

Governance committee oversight

The ICS Risk within the Group is currently governed via the Board Risk Committee who has responsibility for approving the definition of ICS Risk and the Group Risk Appetite. In addition, the Group Risk Committee has delegated authority to the Group Non-Financial Risk Committee (GNFRC) to ensure effective implementation of the ICS RTF. The GRC, and GNFRC retain responsibility for oversight of ICS Risk control domains rated very high and high respectively. Sub-committees of the GNFRC have oversight of the management of ICS risks arising from business and functional areas.

These governance committees have responsibility for providing oversight of ICS risks against Risk Appetite and measuring performance of ICS Risk management activities across the first line. Chairs of governance committees ensure adequate representation for all business units and countries across the Group who are responsible for managing ICS Risk. Escalation of risks which fall outside the defined appetite for the Group are overseen by these committees to ensure effective mitigation.

Decision-making authorities and delegation

The ICS RTF is the formal mechanism through which the delegation of ICS Risk authorities is made. The GCRO has delegated Risk Framework Owner authority to the CISO. The CISO has, where appropriate, delegated second line authority to information security officers to assume the responsibilities for approval for business, functions, and countries.

Approval of ICS Risk ratings follow an approval matrix defined by the ICS RTF where the GCRO and CISO sign off very high and high risks respectively.

Information Asset Owners, Information System Owners, and Information Custodians are responsible for the identification, creation and implementation of processes as required to comply with the ICS Policy Framework.

Monitoring

Monitoring and reporting on the Risk Appetite profile ensures that performance which falls outside the approved Risk Appetite is highlighted and reviewed at the appropriate governance committee or authority levels, and ensures that adequate remediation actions are in place where necessary. Identification of ICS risks are performed through the following processes:

- Scanning of external environment: The dynamic risk identification process includes scanning of the external environment through industry and specialist activities; inputs from legal, regulatory, and mandatory bodies; changes to information and technology use in society, opportunities or incidents; and identifying emerging threats to our information assets and systems
- ICS Risk profile assessment exercise: Risks to information assets and systems must be identified using the approach defined within the RTF and a risk rating ascertained. Risks identified within the key control domains defined in the RTF are documented within risk profiles and reviewed monthly as part of risk governance to ensure effective mitigation against the approved appetite. During these reviews, the status of each risk is assessed to identify any changes to materiality and likelihood, which in turn affect the overall risk score and rating. Risks which exceed defined thresholds are escalated to appropriate governance bodies. The CISO performs a consolidation of completed risk profiles for the Group and produces a holistic aggregated risk position with appropriate key control and risk indicators, which are used to govern the overall ICS Risk
- Threat identification: During the risk identification process, the CISO works with the T&I function to ensure an accurate threat profile definition. Business areas report on their threat profile each month to the Business, Product and Functional level Non-Financial Risk Committees ensuring continuous monitoring of threat identification. This is then reported to the GNFRC, who reviews the reports at an enterprise level. Improvements to the Group's threat lintelligence capability are being implemented through 2019.

Stress testing

The CISO will determine ICS Risk controls to be subjected to scenario-based resiliency stress testing and sensitivity analysis, which is aimed to either ensure robustness of control or ability to respond should a control fail. The Group's stress testing approach entails:

- The CISO oversees all ICS Risk-related stress testing the Group carries out to meet regulatory requirements
- Incident scenarios affecting information assets and systems are periodically tested to assess the incident management capability in the Group
- Penetration testing and vulnerability scanning are performed against the Group's internet-facing services and critical information assets/systems

Financial Crime Risk

The Group defines Financial Crime Risk as the potential for legal or regulatory penalties, material financial loss or reputational damage resulting from the failure to comply with applicable laws and regulations relating to international sanctions, anti-money laundering and anti-bribery

Risk Appetite Statement

The Group has no appetite for breaches in laws and regulations related to financial crime, recognising that while incidents are unwanted, they cannot be entirely avoided

Roles and responsibilities

The Global Head, Conduct, Financial Crime and Compliance (CFCC) has overall responsibility for Financial Crime Risk and is responsible for the establishment and maintenance of effective systems and controls to meet legal and regulatory obligations in respect of Financial Crime Risk. The Global Head, CFCC is the Group's Money-Laundering Reporting Officer and performs the Financial Conduct Authority controlled function and senior management function in accordance with the requirements set out by the Financial Conduct Authority, including those set out in their handbook on systems and controls.

As the first line, the business unit process owners have responsibility for the application of policy controls and the identification and measurement of risks relating to financial crime. Business units must communicate risks and any policy non-compliance to the second line for review and approval following the model for delegation of authority.

Mitigation

There are three Group policies in support of the Financial Crime Risk Type Framework:

- Anti-bribery and corruption as set out in the Group Anti-Bribery and Corruption Policy
- Anti-money laundering and countering terrorists financing as set out in the Group Anti-Money Laundering and Counter Terrorist Financing Policy
- Sanctions as set out in the Group Sanctions Policy

The Group operates risk-based controls in support of its Financial Crime Risk programme, including (but not limited to):

- Client due diligence, to meet Know Your Customer requirement
- Surveillance, including transaction screening, name screening and transaction monitoring
- Global risk assessment, to understand and quantify the inherent and residual Financial Crime Risk across the organisation

The strength of these controls are tested and assessed through the Group's Operational Risk Type Framework, in addition to oversight by the Financial Crime Compliance Assurance and Group Internal Audit.

Governance committee oversight

Financial Crime Risk within the Group is governed by the Group Financial Crime Risk Committee which is appointed by and reports into the Group Risk Committee. The Group Financial Crime Risk Committee is responsible for ensuring the effective management of Operational Risk relating to Financial Crime Risk compliance throughout the Group in support of the Group's strategy and in line with the Group's Risk Appetite, Enterprise Risk Management Framework and Financial Crime Risk Type Framework.

The Board Financial Crime Risk Committee is appointed by the Board, to provide oversight of the effectiveness of the Group's policies, procedures, systems, controls and assurance mechanism designed to identify, assess, manage, monitor, detect or prevent money laundering, non-compliance with sanctions, bribery, corruption, and tax crime by third parties.

Decision-making authorities and delegation

The Global Head, CFCC is the Risk Framework Owner for Financial Crime Risk under the Group's Enterprise Risk Management Framework, and has delegated authorities to effectively implement the Financial Crime Risk Type Framework, to the Co-Heads, Financial Crime Compliance.

Certain aspects of Financial Crime Compliance, second line oversight and challenge, are futher delegated within the CFCC function. Approval frameworks are in place to allow for risk-based decisions on client on-boarding, potential breaches of sanctions regulation or policy, and situations of potential anti-money laundering and anti-bribery and corruption.

Monitoring

The Group monitors Financial Crime Risk compliance against a set of Risk Appetite metrics that are approved by the Board. These metrics are reviewed periodically and reported regularly to both the Group Financial Crime Risk Committee and Board Financial Crime Risk Committee.

Stress testing

The assessment of Financial Crime vulnerabilities under stressed conditions or extreme events with a low likelihood of occurring is carried out through Enterprise Stress Testing.

Principal uncertainties

In addition to our Principal Risk Types that we manage through Risk Type Frameworks, policies and Risk Appetite, we also maintain an inventory of our principal uncertainties. Principal uncertainties refer to unpredictable and uncontrollable outcomes from certain events which may have the potential to impact our business materially

In 2018, we undertook a thorough review of our principal uncertainties, using the approach described in the Enterprise Risk Management Framework section (pages 193 to 197). The key results of the review are detailed below.

Key changes to our principal uncertainties

The following item has been removed as a principal uncertainty:

- Korean peninsula geopolitical tensions – Due to the denuclearisation discussions relating to the Korean peninsula, we believe this risk has decreased; however, we continue to conduct regular stress tests and assess contagion risks arising from risk levels and associated contingency plans

The following items have been amended or added as new principal uncertainties:

- Extended trade tensions driven by geopolitics and trade imbalance – This risk was previously known as "Increase in trade protectionism driven by nationalist agenda" and has been renamed to cover increasing concerns on potential trade tensions and the adoption of protectionist policies
- China slowdown and impact on regional economies with close ties to China – This risk was previously known as "Moderation of growth in key footprint markets led by China" and has been renamed to monitor and assess the impact from slowdown in China and associated regional economies
- Emerging Markets – upcoming elections, interest rate rises and foreign exchange (FX) risks – This risk was previously known as "Sharp interest rate rises and asset price corrections" and has been broadened to cover Emerging Market (EM) risks
- New technologies and digitisation – This risk has been split into two to adequately capture the opportunity or business disruption and obsolescence risk from new technologies and increased data privacy and security risks respectively which could impact many elements of banking

Based on our current knowledge and assumptions, our list of principal uncertainties is set out below, with our subjective assessment of their impact, likelihood and velocity of change. This reflects the latest internal assessment of material risks that the Group faces as identified by senior management. This list is not designed to be exhaustive and there may be additional risks which could materialise or have an adverse effect on the Group. Our mitigation approach for these risks may not be successful in completely eliminating them, but rather shows the Group's attempt to reduce or manage the risk. As certain risks develop and materialise over time, management will take appropriate incremental steps based on the materiality of the impact of the risk to the operations of the Group.

Geopolitical considerations (Risk ranked according to severity)

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
Extended trade tensions driven by geopolitics and trade imbalance Potential impact: **High** Likelihood: **High** Velocity of change: **Moderate**	↑	→ Trade tensions between the United States and China continue to rise driven by trade imbalance as well as geopolitical tensions. The US imposed trade tariffs on a further $200 billion of imports from China in late September 2018 (China retaliated with tariffs on $60 billion of goods). A 25% tariff may be imposed if the two countries are unable to reach an agreement which could start another round of devaluation → A full-fledged and/or extended US–China trade tensions could destabilise the world economy. The adoption of protectionist policies driven by nationalist agendas could disrupt established supply chains and invoke retaliatory actions. Other countries could introduce tariffs on goods and services available domestically or from other economies. These would impact global trade → The Group has a significant revenue stream from supporting cross-border trade	→ A sharp slowdown in world trade and global growth is a feature of the Group stress scenarios including the Internal Capital Adequacy Assessment Process (ICAAP) and the annual Bank of England stress testing exercise. These stress tests provide visibility to key vulnerabilities so that management can implement timely interventions

↑ Risk heightened in 2018 ↔ Risk remained consistent with 2017 levels

Potential impact (Gross risk assessment) Refers to the extent to which a risk event might affect the Group	**Likelihood (Gross risk assessment)** Refers to the possibility that a given event will occur	**Velocity of change** Refers to when the risk event might materialise
High *(significant financial or non-financial risk)*	High *(almost certain)*	Fast *(risk of sudden developments with limited time to respond)*
Medium *(some financial or non-financial risk)*	Medium *(likely or possible)*	Moderate *(moderate pace of developments for which we expect there will be time to respond)*
Low *(marginal financial or non-financial risk)*	Low *(unlikely or rare)*	Steady *(gradual or orderly developments)*

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
Middle East political situation Potential impact: **Medium** Likelihood: **Medium** Velocity of change: **Moderate**	↔	→ Qatar has adjusted to the trade and diplomatic embargo by the Gulf Cooperation Council (GCC). It is unlikely that the parties to the dispute will rush to pursue a diplomatic solution which may leave a lasting rift in the GCC → There is risk of escalation between Saudi Arabia and Turkey as events surrounding the death of journalist Jamal Kashoggi develop. The US congress is likely to sustain pressure on Saudi Arabia despite the efforts of the Trump administration and Saudi Arabia to de-escalate → With US sanctions against Iran having come into effect in November 2018, we anticipate that the stand-off between Iran and Saudi Arabia will continue → The Group has a material presence across the region	→ The impact of the Qatar diplomatic crisis on our portfolio has been limited so far. Risk Appetite and underwriting standards have been adjusted to reflect current conditions → There is constant monitoring at regional and country level to detect horizon risks and analyse any potential adverse developments. This included a planned Strategy and Portfolio Review of Saudi Arabia in November 2018
Brexit implications Potential impact: **Low** Likelihood: **High** Velocity of change: **Fast**	↑	→ The exit of the UK from the European Union (EU) (Brexit) could have implications on the economic outlook for the eurozone and the UK, which might in turn have global implications because of change in policy direction. The uncertainties linked to the Brexit negotiations process could delay corporate investment decisions until there is more clarity → There continues to be uncertainty on UK's exit from Europe → The first order impact of Brexit on the Group from a Credit Risk or portfolio perspective is limited given the nature of the Group's activities. However, as we have set up a new EU subsidiary, the operating environment and client migration to the new subsidiary are impacted given the uncertainty on Brexit negotiations	→ We continue to assess and manage post-Brexit risk and the practical implications through the Brexit Executive Committee chaired by a Management Team member. We have also evaluated the potential implications from a transition and will continue monitoring the progress of the political negotiations → We have set up a new EU subsidiary and optimised our EU structure to mitigate any potential impact to our clients, our staff and the Group as a result of Brexit, including loss of EU passporting rights. Set-up activities are progressing well and we have obtained the full banking licence to commence operations in March 2019

Macroeconomic considerations

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
China slowdown and impact on regional economies with close ties to China Potential impact: **High** Likelihood: **Medium** Velocity of change: **Steady**	↔	→ Asia remains the main driver of global growth supported by internal drivers, led by China → China's economy has performed strongly since the beginning of 2018. However key focus remains on the government-led deleveraging efforts, economic reforms, state owned enterprises, and recent monitory policy actions to cut the reserve requirements for most banks → Macroeconomic environment in the Greater China/North Asia region is threatened by US-China trade tensions → Highly trade oriented economies such as Hong Kong and Singapore with close ties to China would weaken in the event of an economic slowdown in China. Regional supply chain economies such as Korea, Taiwan and Malaysia would be impacted from a fall in economic activity → Greater China, North Asia and South-East Asian economies remain key strategic regions for the Group	→ As part of our stress tests, severe stress in the global economy associated with a sharp slowdown in China was assessed in the ICAAP and Bank of England stress testing in 2018 → Exposures that result in material loan impairment charges and risk-weighted assets inflation under stress tests are regularly reviewed and actively managed → A global downturn with shocks concentrated on China and countries with close trade links with China is one of the regular run market and traded risk stress tests → We continue to monitor data from Greater China, North Asia and South-East Asia

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
Emerging Markets (EM) – upcoming elections, interest rate rises and FX risks Potential impact: **Medium** Likelihood: **High** Velocity of change: **Moderate**	↑	→ EM equities officially entered a bear market in September 2018, following a 20 per cent decline from their peak in January 2018. Many EM currencies have weakened to multi-year lows against the US dollar (examples: Indian rupee and South African rand). South Africa also entered its first recession since the global financial crisis → Such increases in interest rates and weakening of local currencies in EMs could have an impact on the highly leveraged corporate sector, as well as countries with high current account deficits or high foreign currency share of domestic debt. Property, commodities and asset prices would also come under pressure → This could also adversely impact the credit quality of the Group's exposures, and our ability to reprice these exposures in response to changes in the interest rate environment → Of particular concern is the outlook for EMs, specifically the risk of capital outflows and weakening domestic currencies, with the associated increased domestic political volatility. We see increased political volatility, across EMs – like India, Nigeria, Thailand and Sri Lanka – with upcoming elections	→ We continue to monitor countries deemed to have a negative outlook and heightened probability of a downgrade to their internal Sovereign Risk rating, based on vulnerability to recent economic, business, political and/or social developments over a 12-month horizon → We continue to monitor tightening of monetary policy conditions intended to support domestic currencies in the ASEAN & South Asia region and a potential slowdown in economic growth, with recent policy rate hikes from central banks in Indonesia and Philippines → We continue to adjust our outlook and ratings based on political events and volatility

Environmental and social considerations

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
Climate-related physical risks and transition risks[1] Potential impact: **High** Likelihood: **High** Velocity of change: **Moderate**	↑	→ National governments have, through the UN Framework Convention on Climate Change (UNFCCC) process and Paris Agreement, made commitments to enact policies which support the transition to a lower-carbon economy, limiting global warming to less than 2°C and therefore mitigating the most severe physical effects of climate change → Such policies may, however, have significant impacts, for example, on energy infrastructure developed in our markets, and thus present 'transition' risks for our clients → Conversely, if governments fail to enact policies which limit global warming, the Group's markets are particularly susceptible to 'physical' risks of climate change such as droughts, floods, sea level change and average temperature change → In September 2018, the Bank of England published a report 'Transition in thinking' on practices in the UK banking sector, finding that only 10 per cent of banks were taking a strategic approach to climate change → This was followed by a PRA consultation paper and draft supervisory statement in October 2018, proposing significant measures to be taken by banks → When the Group was reviewing its power generation position statement in 2018, it received significant engagement on climate change from large investors and civil society	→ We have participated, via a UN-led initiative, the United Nations Environment Programme Finance Initiative (UNEP-FI), in the development of pilot scenario analysis tools for physical and transition risks for energy utilities clients and other high-emitting sectors. We are using our experiences as we develop additional tools → We are also involved in a wide range of collaborative initiatives related to climate risk management, as well as opportunity identification → We are working to develop tools to measure, manage and ultimately reduce the emissions related to the financing of our clients → We have reduced our Risk Appetite to carbon-intensive sectors by introducing technical standards for coal-fired power plants, and restrictions on new coal mining clients and projects. These standards are reviewed on a regular basis, and in September 2018 we announced that we would no longer provide financing for new coal-fired power plants anywhere in the world → We are developing a climate risk management framework → We have made a public commitment to fund and facilitate $4 billion toward clean technology between 2016 and 2020. In 2018, we funded $2.9 billion taking us to a cumulative total of $4.9 billion since January 2016

1 Physical risk refers to the risk of increased extreme weather events while transition risk refers to the risk of changes to market dynamics due to governments' responses to climate change

Legal considerations

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
Regulatory reviews and investigations, legal proceedings Potential impact: **High** Likelihood: **High** Velocity of change: **Moderate**	⇔	→ The Group has been, and may continue to be, subject to regulatory actions, reviews, requests for information (including subpoenas and requests for documents) and investigations across our markets, the outcomes of which are generally difficult to predict and could be material to the Group → In recent years, authorities have exercised their discretion to impose increasingly severe penalties on financial institutions in connection with violation of laws and regulations, and there can be no assurance that future penalties will not be of increased severity → The Group is also party to legal proceedings from time to time, which may give rise to financial losses or adversely impact our reputation in the eyes of our customers, investors and other stakeholders	→ We have invested in enhancing systems and controls, and implementing remediation programmes (where relevant) → We are cooperating with all relevant ongoing reviews, requests for information and investigations and actively managing legal proceedings with respect to legacy issues (refer to Note 26 – Legal and regulatory matters) → We continue to train and educate our people on conduct, conflicts of interest, information security and financial crime compliance in order to reduce our exposure to legal and regulatory proceedings
Regulatory changes Potential impact: **Medium** Likelihood: **High** Velocity of change: **Fast**	⇔	→ In July 2017, the CEO of the UK Financial Conduct Authority (FCA) announced that beyond 2021 the FCA would no longer encourage panel banks to submit quotes to LIBOR. While we do not submit to LIBOR, LIBOR is heavily relied upon by the Group as a reference rate, in various client products and for enterprise-level processes and funding. Regulators are trying to catalyse a voluntary transition to alternative risk-free rates (RFRs) → Rules have been defined in many key areas of regulation that could impact our business model and how we manage our capital and liquidity. In particular, the upcoming Basel III proposed changes to capital calculation methodology for Credit and Operational risk, revised framework for securitisation and Credit Valuation Adjustment risk, fundamental review of the trading book, large exposures and implementation of margin reforms, and bank recovery and resolution directive for total loss absorbing capacity → Ongoing regulatory scrutiny and emphasis on local responsibilities for remotely booked business. The degree of reliance on global controls is reducing, and the focus is on local controls and governance → Increased sanctions risk due to the US exiting the Joint Comprehensive Plan of Action (JCPOA, or commonly known as the Iran Nuclear Deal)	→ We actively monitor regulatory initiatives across our footprint to identify any potential impact and change to our business model → A Group-wide programme is being established to manage the transition from LIBOR to alternate RFRs over the coming years → With respect to Basel III: – We are closely monitoring developments, and conducting sensitivity analyses on the potential headwinds and opportunities – We continuously review a menu of prospective capital accretive actions, along with impact to the Group strategy and financial performance → Relevant product areas have implemented project management or programme oversight to review and improve the end-to-end process, including oversight and accountability, policies and standards, transparency and management information, permission and controls, legal-entity level limits and training → We are monitoring the potential changes to the Iran sanctions regime and will take actions accordingly to ensure compliance

Technological considerations

Principal uncertainties	Risk trend since 2017	Context	How these are mitigated/next steps
New technologies and digitisation (including business disruption risk, responsible use of AI and obsolescence risk) Potential impact: **High** Likelihood: **High** Velocity of change: **Moderate**	↑	→ New technologies have continued to gather speed with a growing number of use cases that address evolving customer expectations → In Retail Banking, we continue to observe significant shifts in customer value propositions as markets deepen. Fintechs and existing payment players are increasing digital-only banking offerings to provide consumers with the convenience of banking on-the-go. There is growing usage of AI and machine learning to personalise customer experiences, e.g. virtual chatbots to provide digital financial advice and predictive analytics to cross-sell products. → In Corporate Banking, we observe an increasing focus on process digitisation to boost cost efficiencies. There are growing use cases for blockchain technologies, e.g. to streamline cross-border payments, automate Know Your Customer compliance processes. AI and machine learning have also been increasingly used in predictive risk modelling, e.g. loan default forecasts → Regulators are increasing emphasis on the importance of resilient technology infrastructure in terms of elimination of cyber risk and improving reliability. The challenge is in renewing the estate to reduce the risks presented by obsolescence when the demands of ongoing technology investment delivering into this tech estate and its required performance levels continue to rise significantly.	→ We continue to monitor emerging trends and new developments, opportunities and risks in the technology space, which may have implications on the banking sector → In 2017, the Group set up the SC Ventures unit to spearhead bank-wide digital advancement. The unit is gaining momentum to promote innovation, invest in disruptive technologies and deliver client digital solutions. SC Ventures focuses its activities in three key areas: – Catalysts: Internal consulting team to support the Group's business units in problem-solving and developing best practices in innovation – Investments: Professional investment team to manage the Group's minority investments in third-party fintechs – Ventures: Venture management unit to sponsor and oversee new wholly and partially owned ventures, with a focus on disrupting business models in the Group's operating markets → The Group has continued to make headway in harnessing new technologies to develop innovative solutions, e.g. blockchain-based cross-border wallet remittance service between Hong Kong and Philippines in partnership with Ant Financial. We have also invested in new machine learning technologies that rapidly analyse large datasets and fine-tune the accuracy of our financial crime surveillance tools → In addition, we are developing a framework to ensure Fairness, Ethics, Accountability and Transparency (FEAT) in the Group's usage of AI. We continue to deploy risk-minded controls to ensure that all cloud-based services adhere to a common governance model → We are actively targeting the reduction of obsolescent/end of support technology following a Technology & Innovation-led approach under the oversight of Risk Management and the Group's senior executives. The target is to address the Group's obsolescence risk, by evergreening and use of new technologies such as the Cloud. In addition, we also continue our client focus by delivering outage reductions, enhanced protection by raising cyber defences and efficiency by improvements to technology deployment
Increased data privacy and security risks from strategic and wider use of data Potential impact: **High** Likelihood: **High** Velocity of change: **Fast**	↑	→ As digital technologies grow in sophistication and become further embedded across the banking and financial services industry, the potential impact profile with regards to data risk is changing. The cyber threat landscape is evolving in terms of scope and pace. Banks may become more susceptible to technology-related data security risks as well as customer privacy. The growing use of big data for analysis purposes and cloud computing solutions are examples of this → In addition, these risks represent an emerging and topical theme both from a regulatory and compliance perspective (i.e. the EU General Data Protection Regulation (GDPR) raises the profile of data protection compliance) → As the Group moves towards cloud computing solutions, the increasing use of big data for analysis purposes leads to increased susceptibility to data security and customer privacy risks	→ We have existing governance and control frameworks for the deployment of new technologies and services → To manage the risks posed by rapidly evolving cyber security threats and technology adoption, we have designed a programme to focus on security improvements and build a sustainable plan that will secure its information and technology assets for the long term. The programme is progressing with capability being built out in multiple areas including governance, investment prioritisation and execution risk management → We maintain a vigilant watch on legal and regulatory developments in relation to data protection and customer privacy to identify any potential impact to the business and to implement appropriate mechanisms to control this risk → For the Group, GDPR principally impacts Group locations and client segments in the EU, functions such as Human Resources and downstream suppliers such as hubs and external vendors that process personal data caught by the GDPR (EU personal data). A GDPR programme has been established to review and remediate vendor contracts and intra-group agreements that involve the processing of EU personal data

Capital review

The Capital review provides an analysis of the Group's capital and leverage position and requirements

Capital summary

The Group's capital and leverage position is managed within the Board-approved risk appetite. The Group is well capitalised with low leverage and high levels of loss-absorbing capacity.

Capital, leverage and RWA	31.12.18	31.12.17
CET1 capital	**14.2%**	13.6%
Tier 1 capital	**16.8%**	16.0%
Total capital	**21.6%**	21.0%
UK leverage	**5.6%**	6.0%
Risk-weighted assets (RWA) $million	**258,297**	279,748

The Group's Common Equity Tier 1 (CET1) capital and Tier 1 leverage position were ahead of both the current requirements and the expected end-state requirements for 2019. For further detail see the Standard Chartered PLC Pillar 3 Disclosures 2018 section on Capital.

The Group's current Pillar 2A requirement reduced in 2018 to 2.9 per cent of RWA, of which at least 1.6 per cent must be held in CET1. This requirement can vary over time.

The Group currently estimates its minimum requirement for own funds and eligible liabilities (MREL) at 21.8 per cent of RWA from 1 January 2022. The Group's combined buffer (the capital conservation, global systemically important institution (G-SII) and countercyclical buffers) is additive, resulting in a current estimate of its total loss absorbing capacity requirement of 25.7 per cent of RWA from 1 January 2022. The Group estimates that its MREL position was around 27.2 per cent of RWA and around 9.5 per cent of leverage exposure at 31 December 2018.

The Group continued its programme of MREL issuance from its holding company in 2018, issuing $5.0 billion of MREL eligible securities across senior debt and Tier 2 during the period including the Group's inaugural issuance of US dollar callable senior notes. As part of its proactive approach to capital management, the Group successfully conducted a liability management exercise to buy back British pound sterling denominated debt and improve the capital efficiency of the non-equity capital stock.

Regulatory update

The European Commission has proposed amendments to the Capital Requirements Directive, the Capital Requirements Regulation and the Bank Recovery and Resolution Directive. Any proposed reforms remain subject to change and until the proposals are in final form it is uncertain how they will affect the Group.

The Group remains a G-SII, with a 1.0 per cent G-SII CET1 buffer which phases in at a rate of 0.25 per cent per year and was fully implemented on 1 January 2019. The Standard Chartered PLC 2017 G-SII disclosure is published at: http://investors.sc.com/fullyearresults

In line with previous guidance, the decrease in the CET1 capital ratio on adoption of the IFRS 9 accounting standard was around 13 basis points (bps) after considering the offset against existing regulatory expected losses. Under transitional rules, the day-one impact on the CET1 ratio was negligible.

In the Bank of England's 2018 stress tests, under the hypothetical annual cyclical scenario, the Group exceeded all hurdle rates. The Group has a diverse and liquid balance sheet and these results demonstrate the Group's continued capital strength and increased resilience to stress.

Capital ratios (unaudited)

	31.12.18	31.12.17
CET1	14.2%	13.6%
Tier 1 capital	16.8%	16.0%
Total capital	21.6%	21.0%

CRD IV Capital base[1]

	31.12.18 $million	31.12.17 $million
CET1 instruments and reserves		
Capital instruments and the related share premium accounts	5,617	5,603
Of which: share premium accounts	3,965	3,957
Retained earnings	25,377	25,316
Accumulated other comprehensive income (and other reserves)	11,878	12,766
Non-controlling interests (amount allowed in consolidated CET1)	686	850
Independently reviewed interim and year-end profits	1,072	1,227
Foreseeable dividends net of scrip	(527)	(399)
CET1 capital before regulatory adjustments	44,103	45,363
CET1 regulatory adjustments		
Additional value adjustments (prudential valuation adjustments)	(564)	(574)
Intangible assets (net of related tax liability)	(5,146)	(5,112)
Deferred tax assets that rely on future profitability (excludes those arising from temporary differences)	(115)	(125)
Fair value reserves related to net losses on cash flow hedges	10	45
Deduction of amounts resulting from the calculation of excess expected loss	(875)	(1,142)
Net gains on liabilities at fair value resulting from changes in own Credit Risk	(412)	(53)
Defined-benefit pension fund assets	(34)	(40)
Fair value gains arising from the institution's own Credit Risk related to derivative liabilities	(127)	(59)
Exposure amounts which could qualify for risk weighting of 1250%	(123)	(141)
Total regulatory adjustments to CET1	(7,386)	(7,201)
CET1 capital	36,717	38,162
Additional Tier 1 capital (AT1) instruments	6,704	6,719
AT1 regulatory adjustments	(20)	(20)
Tier 1 capital	43,401	44,861
Tier 2 capital instruments	12,325	13,927
Tier 2 regulatory adjustments	(30)	(30)
Tier 2 capital	12,295	13,897
Total capital	55,696	58,758
Total risk-weighted assets (unaudited)	258,297	279,748

1 CRD IV capital is prepared on the regulatory scope of consolidation

Movement in total capital

	31.12.18 $million	31.12.17 $million
CET1 at 1 January	**38,162**	36,608
Ordinary shares issued in the period and share premium	**14**	6
Profit for the period	**1,072**	1,227
Foreseeable dividends net of scrip deducted from CET1	**(527)**	(399)
Difference between dividends paid and foreseeable dividends	**(575)**	(233)
Movement in goodwill and other intangible assets	**(34)**	(256)
Foreign currency translation differences	**(1,161)**	1,363
Non-controlling interests[1]	**(164)**	41
Movement in eligible other comprehensive income[2]	**60**	80
Deferred tax assets that rely on future profitability	**10**	72
Decrease/(increase) in excess expected loss[1]	**267**	(402)
Additional value adjustments (prudential valuation adjustment)	**10**	86
IFRS 9 day-one transitional impact on regulatory reserves[1]	**(441)**	–
Exposure amounts which could qualify for risk weighting	**18**	27
Other	**6**	(58)
CET1 at 31 December	**36,717**	38,162
AT1 at 1 January	**6,699**	5,684
Issuances net of redemptions	**–**	992
Foreign currency translation difference	**(15)**	23
Other	**–**	–
AT1 at 31 December	**6,684**	6,699
Tier 2 capital at 1 January	**13,897**	15,146
Regulatory amortisation	**166**	779
Issuances net of redemptions	**(1,713)**	(2,907)
Foreign currency translation difference	**(215)**	676
Tier 2 ineligible minority interest	**144**	233
Other	**16**	(30)
Tier 2 capital at 31 December	**12,295**	13,897
Total capital at 31 December	**55,696**	58,758

1 See impact of IFRS 9 on CET1

2 Movement in eligible other comprehensive income includes own credit gains

The main movements in capital in the period were:

- The CET1 ratio increased to 14.2 per cent predominantly as a result of lower RWA
- CET1 capital decreased by $1.4 billion, mainly due to $1.1 billion of dividends paid along with foreseeable dividends, FX translation of $1.2 billion and IFRS 9 day-one transitional adjustment to retained earnings of $0.4 billion being offset, in part, by profit after tax of $1.1 billion
- AT1 remained at $6.7 billion during the period
- Tier 2 capital reduced by $1.6 billion to $12.3 billion as a result of redemptions and the impact of the liability management exercise more than offsetting the new issuance of $0.5 billion of Tier 2 in the period

Impact of IFRS 9 on CET1

	31.12.18 $million	31.12.17 $million
IFRS 9 impact on regulatory reserves net of tax	**(843)**	N/A
IFRS 9 regulatory static transitional relief	**402**	N/A
IFRS 9 day-one transitional impact on regulatory reserves	**(441)**	N/A
IFRS 9 impact on excess expected loss shield	**572**	N/A
IFRS 9 impact on non-controlling interest	**(57)**	N/A
Overall net day-one transitional impact of IFRS 9 on CET1 capital	**74**	N/A

Risk-weighted assets by business (unaudited)

	31.12.18			
	Credit Risk $million	Operational Risk $million	Market Risk $million	Total risk $million
Corporate & Institutional Banking	96,954	13,029	19,008	128,991
Retail Banking	35,545	7,358	–	42,903
Commercial Banking	27,711	2,770	–	30,481
Private Banking	5,103	758	–	5,861
Central & other items	45,825	4,135	101	50,061
Total risk-weighted assets	211,138	28,050	19,109	258,297

	31.12.17			
	Credit Risk $million	Operational Risk $million	Market Risk $million	Total risk $million
Corporate & Institutional Banking	109,368	14,740	22,994	147,102
Retail Banking	36,345	7,761	–	44,106
Commercial Banking	29,712	3,356	–	33,068
Private Banking	5,134	809	–	5,943
Central & other items	45,671	3,812	46	49,529
Total risk-weighted assets	226,230	30,478	23,040	279,748

Risk-weighted assets by geographic region (unaudited)

	31.12.18 $million	31.12.17 $million
Greater China & North Asia	81,023	84,593
ASEAN & South Asia	87,935	96,733
Africa & Middle East	53,072	56,437
Europe & Americas	40,789	44,735
Central & other items	(4,522)	(2,750)
Total risk-weighted assets	258,297	279,748

Movement in risk-weighted assets (unaudited)

	Credit Risk								
	Corporate & Institutional Banking $million	Retail Banking $million	Commercial Banking $million	Private Banking $million	Central & other items $million	Total $million	Operational Risk $million	Market Risk $million	Total risk $million
At 1 January 2017	106,834	33,210	27,553	5,129	41,149	213,875	33,693	21,877	269,445
Assets (decline)/growth	(6,363)	2,349	1,973	445	2,273	677	–	–	677
Net credit migration	4,035	74	(465)	–	9	3,653	–	–	3,653
Risk-weighted assets efficiencies	(2,295)	–	–	–	–	(2,295)	–	–	(2,295)
Model, methodology and policy changes	4,990	(368)	–	(575)	2,372	6,419	–	(2,178)	4,241
Disposals	–	(710)	–	–	(443)	(1,153)	–	–	(1,153)
Foreign currency translation	2,167	1,790	651	135	311	5,054	–	–	5,054
Other non-Credit Risk movements	–	–	–	–	–	–	(3,215)	3,341	126
At 31 December 2017	109,368	36,345	29,712	5,134	45,671	226,230	30,478	23,040	279,748
Assets (decline)/growth	(1,527)	1,466	(1,347)	56	2,896	1,544	–	–	1,544
Net credit migration	(2,120)	25	237	–	494	(1,364)	–	–	(1,364)
Risk-weighted assets efficiencies	(3,540)	(597)	–	–	(748)	(4,885)	–	–	(4,885)
Model, methodology and policy changes	(3,338)	(671)	66	–	77	(3,866)	–	(1,948)	(5,814)
Disposals	–	–	–	–	(626)	(626)	–	–	(626)
Foreign currency translation	(1,889)	(1,023)	(957)	(87)	(1,939)	(5,895)	–	–	(5,895)
Other non-Credit Risk movements	–	–	–	–	–	–	(2,428)	(1,983)	(4,411)
At 31 December 2018	96,954	35,545	27,711	5,103	45,825	211,138	28,050	19,109	258,297

Movements in risk-weighted assets

RWA decreased by $21.5 billion, or 7.7 per cent, from 31 December 2017 to $258.3 billion. This was principally due to a decrease in Credit Risk RWA of $15.1 billion, or 6.7 per cent, and reductions in both Market and Operational Risk RWA of $3.9 billion and $2.4 billion respectively.

Corporate & Institutional Banking

Credit Risk RWA decreased by $12.4 billion to $97.0 billion mainly due to:

- $3.5 billion decrease due to RWA efficiencies, mainly $2.4 billion in Financial Markets through novation, trade compressions and process enhancement in collateral recognition and $1.1 billion of savings from RWA efficiency initiatives on sovereign and financial institution exposures
- $3.3 billion decrease in model, methodology and policy changes, mainly due to $2.9 billion PRA-approved internal ratings-based (IRB) model changes relating to LGD parameters
- $2.1 billion decrease due to net credit migration principally in ASEAN & South Asia (ASA)
- $1.9 billion decrease from foreign currency translation due to depreciation of currencies in India, Europe and China against the US dollar
- $1.5 billion RWA decrease from asset balance reduction in Principal Finance and Transaction Banking

Retail Banking

Credit Risk RWA decreased by $0.8 billion to $35.5 billion mainly due to:

- $1.0 billion decrease from foreign currency translation mainly due to depreciation of currencies in Korea and India against the US dollar
- $0.7 billion RWA decrease due to model changes in mortgages in ASA
- $0.6 billion of benefit from RWA efficiency initiatives on exposures secured by residential real estate, partially offset by
- $1.5 billion RWA increase from asset balance growth, primarily in Greater China & North Asia (GCNA)

Commercial Banking

Credit Risk RWA decreased by $2.0 billion to $27.7 billion mainly due to:

- $1.3 billion RWA decrease from asset balance reductions in Transaction Banking and Corporate Finance
- $0.9 billion decrease from foreign currency translation mainly due to depreciation of currencies in India, Pakistan against the US dollar, partially offset by
- $0.2 billion increase due to net credit migration in GCNA

Private Banking

Credit Risk RWA is broadly flat at $5.1 billion. Decreases from foreign currency translation were mostly offset by changes in asset balance growth in Wealth Management products.

Central & other items

Central & other items RWA mainly relates to the Treasury Markets liquidity portfolio, the Group's principal joint venture investment, PT Bank Permata Tbk, equity investments and deferred/current tax assets.

Credit Risk RWA increased by $0.2 billion to $45.8 billion mainly due to:

- $2.9 billion increase in Credit Risk RWA mainly due to higher liquid assets over year end in Treasury Markets
- $0.5 billion increase due to net credit migration in Africa & Middle East (AME) on sovereign exposures
- $0.1 billion increase in model, methodology and policy changes, due to PRA approved IRB model changes relating to LGD parameters, partially offset by
- $1.9 billion decrease from foreign currency translation mainly due to depreciation of currencies in Indonesia, India and Pakistan against the US dollar
- $0.7 billion of benefit from RWA efficiency initiatives on sovereign exposures
- $0.6 billion saving from the disposal of an investment in ASA

Market Risk

Total Market Risk RWA (MRWA) decreased by $3.9 billion, or 17.1 per cent from 31 December 2017 to $19.1 billion. This change was due mainly to reduced trading book debt security holdings and to changes in internal models approach (IMA) scope and model.

Operational Risk

Operational Risk RWA reduced by $2.4 billion to $28.1 billion, due to a decrease in the average income over a rolling three-year time horizon, as lower 2017 income replaced higher 2014 income. This represents a 7.9 per cent year-on-year reduction in Operational Risk RWA.

UK leverage ratio

The Group's UK leverage ratio, which excludes qualifying claims on central banks in accordance with a PRA waiver, was 5.6 per cent, which is above the current minimum requirement of 3.6 per cent. The lower UK leverage ratio in the period was due to the combined impact of an increased exposure measure and lower Tier 1 capital (end point).

UK leverage ratio (unaudited)

	31.12.18 $million	31.12.17 $million
Tier 1 capital (transitional)	**43,401**	44,861
Additional Tier 1 capital subject to phase out	**(1,743)**	(1,758)
Tier 1 capital (end point)	**41,658**	43,103
Derivative financial instruments	**45,621**	47,031
Derivative cash collateral	**10,323**	9,513
Securities financing transactions (SFTs)	**61,735**	55,187
Loans and advances and other assets	**571,083**	551,770
Total on-balance sheet assets	**688,762**	663,501
Regulatory consolidation adjustments[1]	**(45,521)**	(31,712)
Derivatives adjustments		
Derivatives netting	**(34,300)**	(29,830)
Adjustments to cash collateral	**(14,827)**	(18,411)
Net written credit protection	**1,221**	1,360
Potential future exposure on derivatives	**28,498**	30,027
Total derivatives adjustments	**(19,408)**	(16,854)
Counterparty risk leverage exposure measure for SFTs	**8,281**	13,238
Off-balance sheet items	**115,335**	96,260
Regulatory deductions from Tier 1 capital	**(6,847)**	(7,089)
UK leverage exposure (end point)	**740,602**	717,344
UK leverage ratio (end point)	**5.6%**	6.0%
UK leverage exposure quarterly average	**734,976**	723,508
UK leverage ratio quarterly average	**5.8%**	6.0%
Countercyclical leverage ratio buffer	**0.1%**	0.1%
G-SII additional leverage ratio buffer	**0.3%**	0.2%

1 Includes adjustment for qualifying central bank claims